FETCHING TOP DOLLAR: HOW A TARGET FIRM'S COMPETITIVE ACTION REPERTOIRE IMPACTS ACQUISITION PREMIUMS

A Dissertation

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ABSTRACT

In this dissertation, I integrate signaling and holistic processing theories to examine how the pattern characteristics of a target firm's competitive actions over time can influence its acquisition premium by reducing information asymmetry. Currently, our knowledge of acquisitions and accompanying premiums is dominated by acquirers' concerns and little is known about how a target firm can influence its value in the eyes of potential buyers. Signaling theory has been used to help examine this issue, but overall applications have remained similar and largely cross-sectional in nature. My research builds on signaling theory and holistic processing theory to suggest patterns in a firm's competitive action repertoire provide current and historical information that can reduce information asymmetries for potential acquirers.

Specifically, I develop theory to predict that target firms with competitive action repertoires exhibiting high simplicity, similarity, and predictability will be associated with high acquisition premiums. I also consider both firm and environmental level characteristics that may potentially moderate these relationships. My results support the underlying assertion in my model, that competitive action repertoire characteristics influence acquisition premiums; but, I find conflicting effects depending on the specific characteristics. Further, I do not find any support for my proposed moderating effects. Theoretical and empirical implications of the research are discussed.

DEDICATION

To my husband, Travis.

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CHAPTER I

INTRODUCTION

Zip2 and Broadcast.com are companies with scant brand recognition today. However, this is not the case for the firms' respective cofounders, Elon Musk with Zip2 and Mark Cuban of Broadcast.com, who remain two of the most widely-known entrepreneurs. Both successfully executed a highly-profitable exit by first preparing their firms to be highly coveted acquisition targets and second, successfully obtaining a substantial premium over the market price when the sale was completed. While the building and managing of the businesses generated shareholder wealth, the founders' ability to extract a high premium from the buyer is perhaps what truly cemented Musk and Cuban as icons for aspiring entrepreneurs. Indeed, as these examples illustrate, acquisitions are a viable and profitable strategy for many entrepreneurs seeking an exit (Graebner & Eisenhardt, 2004). However, how successful such an exit is for an entrepreneur depends largely on the premium captured in the sale.

An acquisition premium, commonly referred to simply as a premium, refers to the price paid for a target firm that is above the firm's pre-acquisition market value (Hitt et al., 2012). Currently in the management literature, our knowledge of the driving forces behind acquisition premiums is dominated by buyer concerns of overpayment (Coff, 1999; Hitt et al., 2012; Sirower, 1997). Indeed, little is known about how a target firm can increase its value in the eyes of potential buyers.

Current evidence suggests that while highly subjective, premiums are largely driven by anticipated synergies on the part of the acquirer (Hitt et al., 2012). The justification for high acquisition premiums is largely based on the potential synergy that can be achieved, which can take two broad forms: (i) the potential for greater operational efficiencies and/or (ii) the potential for financial benefits (Nielsen & Melicher, 1973). Research has used the resource based view (RBV) (Barney 1986; 1991; Dierickx & Cool, 1989) to expand on these concepts, finding that acquiring firms create synergy by capitalizing on the complementary assets of the acquired firm to produce valuable and unique products and services, to generate economics of scale and scope, to eliminate inefficiencies in value chains, and to redeploy resources to more effective or efficient uses, thereby improving the firm's competitive advantage (Hitt et al., 2012).

The variability in assessments of such potential synergies, and thus the value of the target firm, is primarily due to information asymmetries in the acquisitions market. Information asymmetries occur when one actor has more complete or better information than others due to the imperfect flow of information (Hayek, 1945). Initially proposed in the field of economics through the example of used car "lemons" (Akerlof, 1970), in an acquisition market, target firms face significant obstacles in realizing gains due to information asymmetry about (i) the target's quality of assets, (ii) what can be transferred to a buying firm, and (iii) potential synergy between the companies (Coff, 1999). In other words, because target firms' resources and capabilities can be difficult for buyers to clearly identify and value (Heeley, Matusik, & Jain, 2007; Sanders & Boivie, 2004), target firms often face premium discounting (Reuer, Tong, & Wu, 2012).

Thus, in order to reduce acquisition premium discounting and receive the highest premium possible, it is in the best interest of a high quality target firm to reduce information asymmetries and distinguish itself from low quality, or "lemon" firms for the buyer. Generally, in management research, the notion of quality refers to "the underlying, unobservable ability of the [firm] to fulfill the needs or demands of an outsider" (Connelly, Certo, Ireland, & Reutzel, 2011: 43). While maintaining information asymmetries may be in the interest of low quality firms, continued buyer discounting due to previous "lemon" purchases motivates high quality firms to distinguish themselves from others in order to avoid discounting and receive the highest premium possible. Beginning with work in the labor markets (Spence, 1973), signaling theory provides a mechanism for reducing information asymmetries between two parties (Connelly et al., 2011). Coff (2002) suggested that signaling can be applied to the M&A market, finding that acquiring firms can rely on signals to avoid hazards such as adverse selection.

Recently, work in this stream has found that engaging in costly and observable signals that distinguish high quality from low quality firms is a strong method for reducing information asymmetries by target firms (Ragozzino & Reuer, 2011). For example, Reuer and colleagues (2012) found that inter-organizational relationships, such as associations with investment banks, venture capitalists, and alliance partners, can reduce acquirers' offer price discounting due to information asymmetries. However, while the use of inter-organizational relationships, including the use of relationships with M&A market intermediaries such as investment banks, may help reduce uncertainties

regarding the quality of the target (Coff, 1999), these relationships do little to reduce uncertainties regarding what resources could be transferred and what potential synergies might exist between the target and the potential acquirer. In other words, while these signals are important indicators to distinguish quality firms from "lemons" in the market, they do not provide useful information regarding internal resources and potential synergistic gains.

Further, in such previous work little to no concern is given to the target firm's difficulties in engaging in signaling due to its conflicting needs to reduce information asymmetries in the market while simultaneously protecting its proprietary knowledge and sources of competitive advantage from imitation by competitors (Ndofor & Levitas, 2004). Specifically, while engaging in interorganizational relationships may reduce uncertainties, they expose the target firm to considerable risk from knowledge spillovers. Thus, a target firm faces a paradox: it needs to signal information about its internal resource transformation to reduce information asymmetries and premium discounting while simultaneously protecting its competitive position and guarding its proprietary knowledge.

Competitive actions are observable, externally directed, specific moves initiated by a firm to achieve desired objectives (Smith, Grimm, Gannon, & Chen, 1991) and have been found to convey information about a firm's intentions, characteristics, and resources (Basdeo, Smith, Grimm, Rindova, & Derfus, 2006). While commonly split into two categories, strategic and tactical, competitive actions of all types are necessary for a firm to maintain its competitive position and can potentially signal diverse

information about a firm's resources and capabilities. Therefore, most competitive dynamics research considers a broad range of competitive actions from pricing to partnerships when evaluating the influence of a firm's competitive strategy (e.g. Ferrier, 2001; Smith et al., 1991).

However, while competitive actions are costly and observable, both of which are necessary characteristics of signals (Connelly et al., 2011), they are potentially difficult for prospective buyers to interpret and understand. This difficulty is heightened at the corporate level of analysis relevant for the M&A market because of the sheer volume and diversity of actions undertaken, coupled with the possible inability for buyers to interpret long-term strategic intentions from single strategic or tactical "snap-shots" (Davila, Foster, & Gupta, 2003). For these reasons, competitive actions taken across a firm are potentially strong signals but they are subject to a significant amount of noise. However, if strategic and tactical competitive actions are considered over time in the form of a competitive repertoire, as opposed to single instances, patterns or gestalt properties become apparent.

A gestalt property refers to an organized whole that is perceived as more than the sum of its parts. Such characteristics represent "the general quality or character of something" (Merriam-Webster, 2014). Examples of gestalt properties of competitive repertoires include competitive simplicity, similarity, and predictability (Ferrier, 2001; Rindova, Ferrier, & Wiltbank, 2010). Such gestalt properties of competitive repertories may serve as powerful signals in part because it would likely be prohibitively expensive for an organization to mismatch its internal resource transformations with competitive

actions, especially in the long run. These gestalt signals can thus potentially reduce information asymmetries and protect proprietary sources of competitive advantage for a target firm in an acquisition market.

Sensemaking theory and research on gestalt properties in psychology suggest that holistic or global patterns and properties are important signals (i.e., they are costly and observable, Connelly et al., 2011) that are naturally perceived and interpreted (Weick, 1995; Whitson & Galinsky, 2008), and are not present in the component parts of the signal (Rindova et al., 2010). Gestalt properties influence evaluations because they integrate the disparate parts of a sequence into a perceived whole, thus increasing the processing fluency and ease of interpretation of the stimulus (Mishra, Mishra, & Nayakankuppam, 2006). By increasing processing fluency, gestalt properties have been found to consistently increase positive evaluations across a broad range of receivers (Lee & Labroo, 2004). In other words, considering the complexity of the information being conveyed, gestalt characteristics of action sequences are costly and observable signals that can convey important information independent of the individual competitive action signals. As a signal, these gestalt properties convey information to a broad audience of potential acquirers by increasing processing fluency and ease of understanding. Thus, the value of repertoire gestalt characteristics to target firms is not in communicating with a single potential buyer, but in creating broad attractiveness of the target by reducing information asymmetries to multiple potential acquirers.

Building from these arguments, I integrate the recent work on competitive repertoires with work in acquisition premiums by suggesting that competitive repertoire

gestalt characteristics at a firm's corporate level signal valuable information about the transformation of internal resources over time to create value, while simultaneously protecting a target's competitive position. I suggest that this information about internal resources and transformation processes influences acquisition premiums by reducing uncertainties regarding transferability of resources and potential synergies between the target firm and multiple potential acquiring firms, thereby creating competitive pressure for the buyers. Thus, the primary research question in this dissertation is *"How can target firms reduce information asymmetries and raise their acquisition premium through signaling gestalt characteristics of competitive action repertoires to multiple potential buyers?"* My secondary research question seeks to understand the boundary conditions of the signaling value of gestalt properties by asking *"How does the salience of gestalt properties of competitive action repertoires change based on buyer characteristics and environmental conditions?"*

In this work, I seek to integrate competitive action repertoires and acquisition premiums with signaling theory to identify how buyers and sellers overcome information asymmetries. This study makes three primary contributions. First, my work extends signaling theory by suggesting that gestalt characteristics of action or signal sequences are costly and observable signals that can convey important information independent of the individual signals. My work builds on previous research (Rindova et al., 2010) by exploring how targets can reduce uncertainty about their value through complex signaling sequences.

Second, previous work on acquisition premiums has focused on environmental conditions (Nathan & O'Keefe, 1989; Shelton, 2000), upper echelon characteristics (Hayward & Hambrick, 1997; Hitt, Ireland, & Harrison, 2001), compensation design (Datta, Iskandar-Datta, & Raman, 2001; Slusky & Caves, 1991), network influences (Beckman & Haunschild, 2002; Haunschild, 1994), and agency issues with intermediaries (Porrini, 2006; Stouraitis, 2003). However, it has not considered the impact of a target firm's current corporate-level competitive strategies on buyer evaluations and acquisition premiums. I integrate work on competitive repertoires from competitive dynamics as signals in M&A markets in order to address this gap in our understanding of acquisition premiums.

Third, competitive dynamics has focused on understanding the drivers of competitive action/reaction and in turn, firm performance. However, research on other outcomes has been limited. I aim to extend competitive dynamics by introducing another important outcome of competitive strategies: acquisition premiums. Similarly, focusing on sequences of competitive actions, or action repertoires, has been gaining popularity in competitive dynamics in the past decade (Ferrier, 2001; Ndofor, Sirmon, & He, 2011). Current evidence suggests that repertoire characteristics of simplicity, conformity, and predictability are negatively related to firm performance (Ferrier, Smith, & Grimm, 1999; Miller & Chen, 1996a; Miller & Chen, 1996b; Ndofor et al., 2011). However, I suggest these characteristics may increase acquisition premiums for two main reasons. First, because they increase processing fluency on the part of the buyer through pattern perception resulting in more positive evaluations by multiple potential buyers evidenced

by higher premiums. Second, because they are costly signals that convey unique information regarding a target firm's internal resource transformation activities that, in turn, reduce information asymmetries regarding resource transferability and potential synergies to multiple prospective acquiring firms. Thus, this work explores the alternative consequences of repertoire characteristics on a target firm's financial outcomes.

CHAPTER II

CONCEPTUAL DEVELOPMENT

Information Asymmetries in Acquisition Premiums

Information asymmetries exist when one party in a market has more and/or better information than another party. Examples of such information disparities in transactions include when a borrower knows more about its creditworthiness than a lender, a person knows more about his or her medical conditions and prospects than an insurance company, and, most famously, a seller knows more about a used car than the buyer (Akerlof, 1970). All of these examples can be characterized not only by differences in the amount of information between the two parties, but also by the purchasing party's inability to understand and accurately value what the seller is offering.

Broadly, information asymmetries are caused by the imperfect diffusion of knowledge in the market. Because knowledge is dispersed by people, places and time, an individual actor is unlikely to know all possible information about specific opportunities (Hayek, 1945). Building from this, Hayek (1945) challenged economic tradition by rejecting the assumption that all actors have equal and instantaneous access to information. Instead, he suggested that knowledge spreads across a market such that no two individuals possess the same stock of knowledge, information, or interpretations of the environment at a point in time. Despite this early work and the well-known imperfections of knowledge and information in a market, work in economics continued to assume either perfect information or that markets with minor imperfections in

information would behave very similarly. This tradition began to significantly change with the work of a number of economists devoted to understanding the extent to which imperfect information influences decision making and market behavior, leading to the 2001 Nobel Prize for Goerge Akerlof, Michael Spence, and Joseph Stiglitz. Combined, these works became the foundation for the new economics of information which suggests that information is imperfect, obtaining information can be costly, important information asymmetries exist, and the extent of asymmetries can be affected by both individuals and firms (Stiglitz, 2000).

Overall, research has suggested two broad types of information where asymmetry is particularly salient. The first type of information is about intent and the second type is information about quality (Stiglitz, 2000). In the first category, most research on behavior and behavioral intentions in management has focused on using incentives as mechanisms for reducing potential moral hazards. Agency theory has largely been focused on this area by suggesting that principals and agents act in their own self-interest which may or may not be aligned with one another and that by aligning interests through incentives, hazards are reduced (Jensen & Meckling, 1976; Dalton, Hitt, Certo, & Dalton, 2007).

Regarding the second type of information asymmetries, research about latent and unobservable quality has also received considerable attention in contexts such as IPO evaluations (Certo, 2003), investor expectations (Park & Mezias, 2005; Schijven & Hitt, 2012), international subsidiary behavior (Crilly, Zollo, & Hansen, 2012), and acquisitions (Coff, 2002). Of the many contexts where information asymmetries about

latent and unobservable quality have been a focus, the context of acquisitions remains an active area. Specifically within the topic of acquisitions, information asymmetries present an interesting paradox: despite research consistently finding a negative relationship between acquisition premiums and acquirer firm performance (Hitt et al., 2012; Krishnan, Hitt, & Park, 2007), firms are often willing to pay substantial premiums in order to acquire target firms' resources and capabilities with the highest premiums being paid to acquire firms in technology-intensive sectors (Laamanen, 2007; Zhu, 2013).

With the overarching justification for high acquisition premiums being based on potential synergy gains between a the buyer and the target (Hitt et al., 2012; Sirower, 1997), the acquisition market is subject to considerable information asymmetries and adverse selection problems that can lead to offer discounting for a target firm (Coff, 1999; Reuer et al., 2012). For example, acquirers usually possess less accurate information about the quality and value of a target's assets than the target firm does, and this information asymmetry creates uncertainty about the evaluation of the target (Reuer et al., 2012; Zaheer, Hernandez, & Banerjee, 2010). In fact, this information asymmetry and accompanying uncertainty can create a "market of lemons" where firms of poor quality are difficult to distinguish from firms of high quality (Akerlof, 1970). Specifically, target firms face challenges in realizing high premiums due to acquirers' uncertainty about (i) the target's quality of assets, (ii) what can be transferred to a buying firm in an acquisition, and (iii) potential synergy between companies which results in offer discounting by the potential buyers (Coff, 1999).

In summary, the presence of information asymmetries in an acquisition market creates difficulties in evaluating a variety of aspects *ex ante* in a transaction, including intentions of both parties, latent and unobservable quality of the target firm, and the evaluation of the transferability and potential synergy of the target firm's resources and capabilities which in turn results in premium offer discounting for the target firm (Coff, 1999; Stiglitz, 2000). However, signaling theory provides a mechanism for firms to alleviate information asymmetries by conveying information to one another through costly and observable signals (Connelly et al. 2011; Spence 1973). Specifically, in acquisitions, target firms can engage in specific actions to reduce uncertainties about the firm and thus increase premiums (e.g. Reuer et al., 2012). In the next section, I introduce the basic tenets of signaling theory and highlight research related to its use in acquisitions and premiums.

Signaling Theory

Developed from early works in information asymmetries (Akerlof, 1970; Hayek, 1945), signaling theory is broadly concerned with the behavior of two parties (either individuals or organizations) in which the parties have differential information (Connelly et al., 2011). Specifically, signaling theory explains the use of costly and observable actions to convey information and reduce asymmetries between two parties. While this logic is somewhat intuitive, the theory's contribution is in capturing the information aspect of market structures and the related cost of acquiring information (Connelly et al., 2011). In other words, the value of the theory lies not in recognizing information

asymmetries in a market and participants' desire to reduce them, but instead in describing the *actions* and *costs* of conveying and receiving information.

Spence (1973) first proposed signaling theory in the context of labor markets by suggesting that hiring is an example of an investment under conditions of uncertainty. He demonstrated how job applicants can engage in behaviors that reduce the information asymmetries between applicants and recruiters that impede the capability of prospective employers to make effective hiring decisions. Specifically, Spence (1973) suggested that high-quality applicants can distinguish themselves from lower quality applicants by engaging in the costly and observable action of obtaining a higher education degree. He suggested this action was taken by applicants to signal their unobservable quality as candidates to the hiring managers. The key to the success of a signal, in this case higher education, is the reliability of it to differentiate high and low quality actors because it is inherently too costly or difficult for lower quality actors to mimic. In other words, higher quality job applicants are able to withstand the rigors of education whereas lower quality applicants are unlikely to be able to do so. This differentiation ability of a signal is referred to as creating a separating equilibrium and it enables outsiders to accurately distinguish between high- and low-quality firms. If a signal is not able to differentiate firms, then it results in a pooling equilibrium that inhibits outsiders from being able to distinguish between the two types of firms (Cadsby, Frank, & Maksimovic, 1990; Connelly et al., 2011). Thus, a signal is only useful as a differentiator when the cost is sufficiently high in order to create an incentive for high quality actors to engage in it and a disincentive for low quality actors to engage in the signal.

The notion of quality and its assessment has been the basis of most signaling theory models since its inception by Spence (1973). However, quality can be interpreted in a wide variety of ways and contexts (Connelly et al., 2011). For example, while quality in Spence's example refers to the unobservable ability of an applicant, in Ross's (1973) work, quality refers to the ability of a firm to earn positive future cash flows. Often, the notion of quality is also closely related to terms such as reputation (Fischer & Reuber, 2007), legitimacy (Cohen & Dean, 2005), or prestige (Certo, 2003). In general, in management research, quality refers to "the underlying, unobservable ability of the signaler to fulfill the needs or demands of an outsider observing the signal" (Connelly et al 2011: 43).

Signaling theory has been used broadly in management research, though most of the studies can be grouped into either a "strategy" or "entrepreneurship" category based on their context (Connelly et al., 2011). In start-up, young, and IPO firms, signals ranging from board structure and prestige (Certo, Daily, & Dalton, 2001; Certo 2003), venture capital financing events (Davila et al., 2003), TMT composition and heterogeneity (Higgins & Gulati, 2006; Zimmerman, 2008), and founder- and insider-ownership (Busenitz, Fiet, & Moesel, 2005; Jain, Jayaraman, & Kini, 2008) have all been found to reduce uncertainty about the quality of the firm to a variety of receivers, though the primary focus is potential investors. In more established firms, the receiver tends to be more varied, including stakeholders (Deephouse, 2000), shareholders (Goranova, Alessandri, Brandes, & Dharwadkar, 2007; Kang, 2008; Zhang & Wiersema, 2009), consumers (Chung & Kalnins, 2001), investors (Lee, 2001; Park & Mezias,

2005), and competitors (McGrath & Nerker, 2004), causing signals about underlying firm quality to also range more broadly. However, a majority of studies focus on a few types of signals, namely advertising, press releases, and reputation building (Carter, 2006; Chung & Kalnins, 2001; Coff, 2002; Deephouse, 2000), firm governance characteristics including CEOs (Zhang & Wiersema, 2009), board of directors (Kang, 2008; Miller & Triana, 2009), and ownership (Goranova et al., 2007).

In the past five years, strategy research on signaling has begun to explore the importance of inter-organizational ties including alliances and association memberships as a signal of quality for a variety of signalers including IPO firms (Reuer et al., 2013), private equity operators (Balboa & Marti, 2007), and young firms (Gulati & Higgins, 2003). Specifically, work by Reuer and colleagues suggests that firms associated with more reputable investment banks and venture capitalists are more likely to be acquired (Reuer & Ragozzino, 2012) and can enhance their own position in an interorganizational network (Ozmel, Reuer, & Gulati, 2013). Additionally, Reuer et al. (2012) found that these types of interorganizational ties can also increase premiums for a target firm in an acquisition.

While the history of interorganizational relationships with outside parties by targets prior to an acquisition can act as a signal of quality, an alternative explanation exists. Specifically, instead of the target's relationships acting as a signal, it could be that third party firms with ties to both parties act as information brokers (Sleptsov, Anand, & Vasudeva, 2013). These intermediary firms can reduce information asymmetries in the

M&A market, by serving as an important source of specialized information and expertise for the acquirers (Chemmanur & Fulghieri, 1994; Servaes & Zenner, 1996).

However, these intermediary relationships are also rife with agency issues for the buyer. For example, the fees collected by investment bankers from their clients are often determined as a percentage of final purchase price, thus creating conflicting interests in the final price paid (Hitt et al., 2012). In fact, Stouraitis (2003) found that investment banks acting as advisors to acquirers negotiate favorable terms when they invest their own money in the deal, but lead their clients to overpay when they do not have financial incentives. Specifically, he found that the smallest premiums are paid when the bank finances the deal and the largest premiums are paid when the bank is paid a fee contingent on deal completion with premiums between these two extremes found when acquirers do not use advisors.

Similarly, other common intermediaries, such as venture capitalist firms, often have an equity stake in the target firm and thus are aligned with the seller in seeking the highest possible premiums. Acquirer interlocks and network ties with professional intermediaries often also lead to higher premiums because top executives draw on their previous experiences in determining premiums at other companies to evaluate the current acquisition. This effect is heightened under conditions of uncertainty such as in knowledge intensive industries (Haunschild, 1994). Thus, while it may be in the interest of target firms to build interorganizational relationships with third parties in the M&A market to leverage the agency issues between the buyer and the intermediary to capture a

higher premium, the mechanism suggesting that these relationships influence premiums due to their signaling power is suspect.

Regardless of the type of signals used to convey a target's quality, Coff (1999) suggests three information dilemmas for potential acquirers regarding target firms: (i) uncertain quality, (ii) uncertain transferability, and (iii) uncertain synergy potential. While the research on signaling target quality has been strong and varied, though subject to some criticism due to alternative explanations as explained above, there has been limited attention to understanding how targets reduce uncertainties surrounding transferability and synergy.

Ndofor and Levitas (2004) provide an exception, though the context is different than acquisition markets. In this study the authors expand on the difficulties of knowledge intensive firms signaling knowledge differences to capital and labor markets, without enabling competitors to copy or imitate the knowledge. Warner, Fairbank, and Steensma (2006) take a different perspective on the same issue of uncertainties by suggesting a real options framework for understanding acquisitions of firms with intellectual property.

The limited attention to how targets reduce uncertainties surrounding transferability and synergy is especially troubling for the M&A context considering that expected synergies, driven by the transferability and rebundling of resources and capabilities, serve as a main determinant of the premium paid (Hitt et al., 2012). However, this limited work could in part be due to the difficulties in understanding what

within a firm can or should be transferred, and how a target can communicate this value while protecting its competitive position in its product market.

In summary, signaling theory provides a mechanism for understanding how firms can convey information to a variety of markets or receivers. However, in the case of acquisitions, target firms must simultaneously balance the need to convey information regarding not only quality, but also transferability and potential synergies that allows them to increase premiums while also protecting privileged, internal information from competitors. Previous research on signaling theory and M&As has examined a variety of signals such as ownership, financing, board prestige, and interorganizational relationships that can convey overall quality of the target firm. But, this work has not focused on identifying the best signals for conveying information regarding transferability and potential synergies while also enabling a target to continue to compete advantageously against rivals. Recent work on competitive dynamics, specifically the focus on competitive repertoires, may provide a mechanism for firms to signal how they are able to transform their resources over time to generate value. Thus, I suggest that through the management and realization of competitive repertoires over time, targets can convey information about how their resources are best transformed to generate value – signaling important information to multiple prospective acquirers about how their resources could be transferred or rebundled by buyers for potential synergies.

Competitive Action Repertoires

As originally conceptualized, competitive dynamics focuses on the study of interfirm rivalry based on firms' specific competitive actions and reactions, their strategy and organizational context, and their drivers and consequences within the broader field of competitive strategy (Chen, 1996; Chen & Miller, 2012). While the original focus was on the specific actions exchanged by firms, and the pairwise comparison of rivals, more recent work has extended this dyadic view to examine competitive activity at the business (Derfus, Maggitti, Grimm, & Smith, 2008; Ferrier et al., 1999) and corporate levels (Anand, Mesquita, & Vassolo, 2009; Yu & Cannella, 2007). In this dissertation I consider competitive strategy at the corporate level. However, regardless of the level of analysis, research in competitive dynamics centers around three broad purposes: (i) predicting competitive behavior, (ii) capturing asymmetric competitive relationships between firms, and (iii) linking strategy formulation to implementation (Chen & Miller, 2012).

With the extension of competitive dynamics research from action/response dyads to business and corporate levels of analysis, the focus changed to understanding firms' competitive actions over time, commonly referred to as competitive repertoires (Miller & Chen, 1996a; Ferrier et al., 1999). Competitive repertoires commonly consider all types of actions taken by a firm in a sequence or time period, including both strategic and tactical actions. While not the first to propose the importance of examining repertoires, Ferrier (2001) suggests that sequences of competitive actions can be interpreted as a process theory of competitive interaction. In other words, competitive

repertoires account for "how the sequence of moves in each attack unfolds over time and the possibility that an intended sequence of actions might give way to an emergent sequence as rivals develop competitive responses" (Ferrer, 2001: 859). This conceptualization gives rise to the notion that while repertoires are managed over time, they are influenced by rivals' actions and the environment as it changes. Thus, it is important to consider both strategic and tactical competitive actions simultaneously to better understand the emergence of a firm's competitive strategy over a given period. Further, by invoking the idea of competitive repertoires as a process theory, the "diagnosis of patterns in observable activities, events or behaviors over time…using the chronological order of events as data" becomes possible (Van de Ven, 1992: 170). In other words, competitive repertoire properties are more than the sum of the parts; they are unique gestalt characteristics of the aggregated set of individual actions (Ariely & Carmon, 2000; Rindova et al., 2010). In seeking to understand the strategic patterns in competitive repertoires, three main gestalt characterizations have become dominant: the simplicity or complexity of an action portfolio (Miller & Chen 1996a), the similarity or deviance of the competitive actions over time from industry norms (Miller & Chen, 1994), and the predictability or unpredictability of a sequence of actions across years (Ferrier, 2001). Each of these characteristics represent a continuum with many firms falling somewhere in between the two extremes.

Competitive repertoire simplicity, and its inverse complexity, refers to the breadth or range of actions taken by a firm over time (Miller & Chen, 1996a). Miller (1993: 117) defines simplicity as "an overwhelming preoccupation with a single goal,

strategic activity, department, or world view – one that increasingly precludes consideration of any others." As related to competitive actions, a firm's repertoire that is characterized by simplicity focuses on a narrow range of actions. It is important to note, however, that a firm engaging in a simple repertoire over time does not have to engage in the exact same behaviors all the time; rather, it engages in relatively few types of competitive actions at any given point of time (Carnes, Xu, & Sirmon, 2015). In other words the difference between a simple or a complex repertoire is not the use of identical actions over a firm's entire history, but rather the range of competitive action types during any given time period.

Repertoire simplicity has been linked to a variety of firm outcomes including performance (Ndofor et al., 2011), firm reputation (Basdeo et al, 2006), industry leader dethronement (Ferrier et al., 1999), and revenue (Miller & Chen, 1996a). Broadly, these works and others suggest that competitive simplicity decreases, while its inverse competitive complexity increases, these desired firm outcomes. For example, Ndofor et al. (2011) suggested that a complex repertoire may increase firm performance because a wide variety of actions may more fully utilize a firm's entire available resource portfolio. Similarly, Miller and Chen (1996a) suggest that the oversimplification of an action repertoire may cause a firm to miss important market opportunities and Ferrier et al (1999) describe how competitive complexity captures the notion of competitiveness as originally described in Austrian economics (e.g. Schumpeter, 1934, 1950; Kirzner, 1973).

The similarity, or inversely the deviance, of a competitive action repertoire differs from repertoire simplicity-complexity because this characteristic reflects the degree of adherence or departure from industry norms for competitive interaction (Ndofor et al., 2011). Specifically, repertoire similarity is represented by a firm that closely follows industry recipes (Sirmon & Hitt, 2009) to guide its competitive behaviors. Alternatively, competitive deviance arises from a novel mix of competitive action types, or from a sequence of actions that are seldom seen in an industry and is synonymous with other terms such as repertoire dissimilarity (Ferrier et al., 1999) and attack heterogeneity (Ferrier & Lee, 2002).

Analogous to research on repertoire simplicity/complexity, repertoire similarity has been found to be negatively associated with a range of firm outcomes. Overall, research has suggested that firms exhibiting repertoire similarity are less able to surprise competitors (Chen & MacMillan, 1992), and thus are easier for competitors to anticipate and imitate or retaliate against (Chen & Miller, 1994). Specifically, competitive action repertoire deviance has been found to increase market share gains by top firms (Caves & Ghemawat, 1992). In fact, D'Aveni (1994) suggests that a firm enacting a mix or sequence of actions that are different from the industry norms, disrupts competition and changes the rules of competition in its favor.

Defined as "the extent to which a firm's sequential order of competitive actions is dissimilar from one attack period to the next," competitive action repertoire unpredictability is the third common repertoire pattern characteristic (Ferrier, 2001: 861). While related to repertoire complexity and deviance, unpredictability does not

require a broad range of actions, or even actions that are outside industry norms, but instead is created when the previously used competitive actions are undertaken in structurally dissimilar sequences compared to previous time periods (Rindova et al., 2010). Unpredictability is a unique characteristic as compared to complexity and deviance because it captures the repetitiveness of action over time, instead of the differences between types of actions by a firm (complexity), or differences in actions between firms within an industry (deviance).

The benefit of competitive unpredictability has been established as the ability to surprise competition (Ferrer, 2001) and aggressively disrupt the status quo of competition within an industry (D'Aveni, 1994). Specifically, competitive unpredictability has been shown to delay competitive response (Ferrier, 2001) due to the inability of firms to link the prior sequence of actions, the current sequence of actions, and performance outcomes (D'Aveni, 1994). Further, unpredictability is often associated with competitive aggressiveness which has been shown to increase firm performance relative to rivals (Ferrier, 2001).

While competitive repertoire simplicity, similarity, and predictability all have been linked to negative performance outcomes in competition in prior research, these same characteristics can serve as beneficial signals to identify quality target firms in the M&A market. In other words, while engaging in simple, similar, and predictable competitive patterns may be detrimental to immediate firm performance, these patterns can serve as gestalt signals that reduce information asymmetries for potential acquirers and thereby increase acquisition premiums for the target firms. Specifically, due to the

high difficulty and cost of engaging in these three competitive gestalts, target firms are able to effectively reduce information asymmetries, increase processing fluency, and create a separating equilibrium that all combine to increase the target firm's acquisition premiums. Thus, there becomes incentives for high quality target firms to engage in simple, similar, and predictable sequences in the form of increased premiums, but disincentives for low quality firms to do the same because of a decrease in firm performance.

In the next chapter, I develop the idea of competitive repertoire gestalts as unique signals independent from the individual actions comprising a sequence and suggest how the presence of such gestalt characteristics can increase acquisition premiums by enhancing buyer understanding. Further, I develop the cost and differentiating ability of each of the three gestalts properties considered herein (simplicity, similarity, and unpredictability) with regards to their ability to serve as effective signals of resource transferability and potential synergies, and thus increase acquisition premiums. Lastly, I discuss how buyer and environmental characteristics can enhance or mitigate the salience of these gestalt signals for the M&A market.

CHAPTER III

THEORETICAL DEVELOPMENT

Repertoire Properties as Gestalt Signals for Acquisition Premiums

Competitive actions are observable, externally directed commitments designed to achieve specific marketplace objectives and thus they convey information about a firm's intentions, characteristics, and resources (Basdeo et al., 2006). While a variety of firm actions such as internal resource investments (e.g., R&D and marketing investments) or governance characteristics (Sanders & Boivie, 2004) can also serve as signals for firms, competitive actions are critical signals as they exhibit high visibility and high strength.

Signal visibility refers to the ability of outsiders and receivers to detect and observe the signal (Ramaswami, Dreher, Bretz, & Wiethoff, 2010). Because competitive actions are externally directed and occur in the competitive marketplace, both rivals and other stakeholders such as potential acquirers are able to clearly observe the action. Signal strength, on the other hand, refers to the level of importance, or salience, a signal has for a given signaler. This notion is akin to what Connelly et al. (2011: 53) describe as signal fit, which is "the extent to which the signal is correlated with unobservable quality." In other words, because competitive actions are externally directed strategic activities taken to achieve specific goals, they are both highly observable and are difficult to decouple from underlying firm characteristics and resources.

For example, in 2011 amid declining performance HP introduced the TouchPad tablet with much fanfare in an apparent effort to signal innovativeness and growth

opportunities. However, after customer backlash due to poor performance, HP cut the price three times within one week before abandoning the product a mere seven weeks after release. Thus, despite the desire by HP to signal quality to the market, by using a competitive action (new product release) without having the underlying capabilities resulted in a public relations nightmare. This example demonstrates how a firm may wish to undertake a competitive action, such as new product launch, to convey quality to the market; however, without the underlying resources and ability to transform such resources, a firm does not have the capacity to complete such actions successfully, as evidenced by HP's price cuts and discontinuation of the TouchPad. Further, the effectiveness of the action taken by the firm in the marketplace suggests the capability of the firm in transforming their resources to generate and capture value in the market. Thus, competitive actions are visible and strong signals due to the expense and difficulty in decoupling the signal (action) from underlying resources.

An important disadvantage to consider in studying competitive actions as market signals is the notion that individual signals are snapshots in a particular point of time (Davila et al., 2003). Competitive actions are only able to convey information to a market about the resources and capabilities within a firm at a given point in time, and in a given set of market conditions. Because organizations operate in dynamic, and sometimes hypercompetitive environments (D'Aveni, 1994), the validity of the information provided by a single signal is difficult to ascertain and signaling firms will need to continue transmitting signals in order to reduce information asymmetries and

maintain differentiation from low quality actors (Janney & Folta, 2003; Park & Mezias, 2005).

Shifting focus in competitive dynamics from individual competitive actions to competitive repertoires parallels this notion of moving from snapshots to patterns in signaling theory. While competitive repertoire characteristics have previously been viewed from a process theory perspective in competitive dynamics (e.g., Ferrier, 2001), the characteristics of aggregate patterns also can be considered gestalt properties because they are distinct from, but comprised of, the sum of the parts. Similarly, from psychological research on pattern perception, gestalt properties are considered characteristics that "depend on the interrelations among component parts" (Kimchi, 1992: 35). These properties have also been described as configurational or emergent (Rindova et al., 2010).

Considering the gestalt properties of competitive repertoires as signals, instead of examining individual signals over time, offers a variety of benefits. First, the gestalt repertoire properties (simplicity, similarity, and predictability) are inherently longitudinal. Repertoire characteristics are the patterns and unique properties of multiple actions taken over time (Ferrier, 2001); thus, gestalt properties offer more information than a single signal transmitted in isolation or with high frequency. Second, gestalt characteristics may offer a clearer view of how a firm is able to utilize and transform its resource base over time – something that is of primary interest for potential buyers desiring to transfer or transform a resource base in order to generate synergies. For example, one firm may engage in a new product release or move into a new market in a

time period prior to a potential buyer evaluating the firm; but, only examining the occurrence, or even number, of these actions does not reveal how a firm is using a diverse resource base over time as engaging in a complex or deviant repertoire might signal.

Finally, by examining repertoire characteristics instead of individual actions, the signal fit is improved because the cost of decoupling the signal from underlying resources or strategic intentions is very high. In the case of a competitive repertoire gestalt characteristic serving as a signal, it would likely be prohibitively expensive for an organization to mismatch its internal resource transformations with competitive actions, especially in the long run. In other words, by examining the gestalt characteristics of action sequences, potential buyers are able to accurately filter out irrelevant actions (noise) and ploys by firms yielding a stronger and truer signal.

An interesting example of the power of patterns is seen in the *Good Judgment Project* (www.goodjudgementproject.com) which is a partnership between three psychologists and the U.S. intelligence community that uses ordinary citizens to predict major events such as terrorist attacks. Specifically, the CIA has found that crowdsourcing information from a few thousand civilians, with no special (top secret) knowledge, yields more accurate results than sourcing information from a few experts with special, top secret information. The conclusion to this counter-intuitive finding is that the increased number of information sources naturally filters out irrelevant information and biases to center around a fairly accurate mean (Spiegel, 2014). Thus, similar to how large numbers of predictions can center around an accurate result, gestalt

properties of competitive actions serve as a viable indicator of the types of resource transformation actions routinely used by firms in order to generate and capture value over time.

While the above arguments suggest that competitive repertoire gestalt properties are strong signals, in the context of an acquisition market, the salience of these signals depends on their ability to reduce information asymmetries. Research in sensemaking theory and work on gestalt properties in psychology suggest that holistic or global patterns and properties are naturally perceived and interpreted (Weick, 1995; Whitson & Galinsky, 2008) and are not present in the component parts of the stimulus (Rindova et al., 2010). Specifically, research on gestalt properties and pattern perception suggest that individuals can integrate information in unfolding sequences of events by attending to salient gestalt properties instead of focusing on recent individual events or signals in isolation (Ariely & Carmon, 2000; Ariely & Zauberman 2000; Einhorn & Hogarth 1986). In fact, research finds that high ambiguity or a lack of control results in seeing and seeking patterns (Whitson & Galinsky, 2008). Because acquisitions are often characterized by high ambiguity (Schijven & Hitt, 2012), the perception and use of gestalt properties becomes particularly important as a mechanism for understanding how information is received and processed by potential acquirers.

Beyond recognizing the efficacy of the signal, gestalt properties influence evaluations because they integrate the disparate parts of a sequence into a perceived whole and thus increase the processing fluency and ease of interpretation (Mishra et al., 2006). Thus, in order to process and understand large amounts of information, receivers

naturally process information in chunks or groups in order to ease their understanding and interpretation of the information. This work in psychology is supported by recent advancements in neuroscience that suggest that humans form perceptions based on complex interactions of identified components (Pelli & Tillman, 2008). For example, while many songs may begin with similar musical notes, it is the combination of these notes, the instruments used, and the melody that enable people to easily recognize and differentiate among the thousands of songs previously heard. Thus, while a person may not remember the first notes of a song, nor even the lyrics, s/he can understand, interpret and reference the song as a whole. Building from this logic, in an acquisitions market buyers searching for a target firm are likely to process the large sets of information, such as various competitive actions, holistically as patterns, regardless of the signalers' intentions, in order to better understand the identity of a firm and how it might integrate with the buyer.

Through increasing processing fluency and a receiver's ease of understanding, gestalt properties have been found to consistently increase positive evaluations (Lee & Labroo, 2004; Reber, Winkeilman, & Schwarz, 1998). In other words, receivers naturally evaluate information that has clear patterns more favorably. While developed in psychology research, the gestalt properties to positive evaluation relationship has been supported in management research in a range of contexts including investors in nascent markets (Rindova et al., 2010) and investor judgments of entrepreneurial identity and new venture plausibility (Navis & Glynn, 2011). Thus, gestalt competitive repertoire characteristics such as simplicity, similarity, and predictability may not only signal

information about the value of resources and help potential buyers understand the possible synergies, but they also form patterns that increase processing fluency and, in turn, increase positive evaluations.

It is important to note here however, that while gestalt properties of competitive action sequences increase the ease of buyer understanding, this information is not targeted to any single potential buyer. Specifically, by reducing information asymmetries and easing interpretation through holistic processing in buyers, targets can engender positive evaluations from a broad audience. For example, Rindova et al. (2010) found that observable competitive patterns increased positive evaluations of firms across many different investors as captured by stock price increases. In an acquisitions market, by creating a broad, positive evaluation it might be possible for target firms to attract multiple bidders, or at least the threat of multiple bidders. In a situation where a potential buyer feels pressure from rivals, premiums are likely to increase (Varaiya, 1987). In fact, the potential for competitive bidding can sometimes inflate the premium beyond the point of reasonable value for the buyer (e.g., winner's curse, Sinower, 1997). While this is not in the best interest of a potential acquirer, from a target firm's perspective enticing multiple bidders can serve the purpose of obtaining the highest possible acquisition premium offer.

Thus, in the M&A market increased positive evaluations can lead to a greater number of interested potential acquirers which in turn may engender higher premiums. Based on this logic, I offer the following proposition:

Proposition 1: Competitive action gestalt characteristics positively influence acquisition premiums.

The above arguments and proposition suggest that the presence of gestalt properties increases processing fluency and thus may increase a target firm's acquisition premium. These arguments serve as a foundation for the hypotheses presented in the next sections, as the benefits of engaging in simple, similar and predictable competitive repertoires is due to the ease of potential acquirers to recognize and understand these patterns. However, the specific salience of these properties as signals depends on their ability to reduce information asymmetries surrounding target quality, transferability, and synergy for a broad audience. Because much prior research has examined ways to help reduce information asymmetries regarding underlying target firm quality (e.g., Reuer et al., 2012), in the next sections, I focus on developing the salience of each of these three gestalt characteristics in turn as signals for transferability and potential synergy in a M&A market. Specifically, I argue that engaging in simple, similar, and predictable competitive action repertoires convey unique information regarding the transferability and potential synergies of a target firm and creates a separating equilibrium where firms without the underlying characteristics are not able to mimic such behaviors. Thus, by engaging in these gestalt characteristics of their competitive action repertoires, target firms are able to reduce information asymmetries for multiple potential buyers and increase their acquisition premiums.

***Competitive Simplicity*.** Engaging in a simple competitive repertoire, where a firm uses a relatively narrow range of actions, may be a signal of having strong internal resources, capabilities, and core competencies. If a firm owns or controls rare and valuable resources, it can focus on a single goal or transformation of these resources in order to generate and capture value (Barney, 1986). In fact, the sustainability of a firm's competitive advantage is a function of the ease with which assets can be substituted or imitated (Dierickx & Cool, 1989). The more difficult it is for rivals to duplicate strategic resources controlled by a firm, the longer a firm is able to leverage its advantage. Because competitive simplicity involves leveraging the same types of actions in a market repeatedly, rivals may be able to identify what the underlying causes are of the focal firm's competitive advantage. However, if the resources and capabilities themselves are difficult to imitate or substitute, a firm does not need to rely on secrecy to sustain its competitive advantage. The firm's competitive advantage is sustained simply by the valuable, rare, inimitable, and nonsubstitutable nature of the controlled resources (Barney, 1991). Thus, competitive simplicity may be a signal of the underlying strength of a resource portfolio.

Further, a simple competitive repertoire may also allow a firm to concentrate on developing and maintaining a few core competencies allowing the firm to obtain the advantages of focus (Rogers, 1992; Treacy & Wiersema, 1995). Such core competencies attract customers and are able to be defended from imitation by rivals (Lenoard-Barton, 1992; Lippman & Rumelt, 1982; Prahalad & Hamel, 1990). Efficiency and effectiveness reduce the costs associated with competition and may allow for a firm to realize superior

gains. In fact, more recent work on the resource-based theory suggests that the synchronization of activities across a firm can provide value above and beyond resources and individual managerial actions (Sirmon, Hitt, & Ireland, 2007; Sirmon, Hitt, Ireland, & Gilbert, 2011). While empirical work on synchronization is limited, current work suggests that firms vary significantly in their ability to integrate actions and that such behaviors are fairly limited (Sirmon & Hitt, 2009). Thus, the ability to integrate actions and resources within a firm and concentrate on developing, maintaining, and leveraging a few core competences in the market may be related to competitive simplicity.

While simple competitive repertoires may often be a function of current or past success, paradoxically, they often can lead to future failure (Miller, 1993; Miller & Chen, 1996a). As described previously, competitive simplicity has been linked to reductions in future performance (Miller & Chen, 1996a). Specifically, the inverse of simplicity has been shown to be related to higher performance (Ndofor et al., 2011), market share gain (Ferrier et al., 1999), better reputation (Basdeo et al 2006), and sales growth and profitability (Ferrier & Lyon, 2004). Further, Miller (1993) argues that a common cause of organizational decline is actually firm simplicity or an overwhelming focus on a single goal or strategic activity. The context for these findings have also been varied, ranging from Fortune 500 firms (Ferrier & Lyon, 2004), to the Most Admired Companies list (Basdeo et al., 2006), to the airline industry (Miller & Chen, 1996a), and to the in vitro medical diagnostic substance manufacturing industry (Ndofor et al., 2011). Overall, these findings across a variety of contexts and outcomes suggest that the costs and risks of engaging in a simple competitive repertoire are high.

Because of the difficulty in engaging in a simple competitive repertoire, as a signal, this gestalt competitive characteristic creates a separating equilibrium. In other words, for firms with strong resources and capabilities, the benefits of engaging in competitive repertoire simplicity are high and the risks are relatively low because these firms are able to sustain their source of competitive advantage despite multiple rivals and potential buyers being able to understand the underlying cause of their advantage. However, for firms without strategic underlying resources and capabilities that rely on out-maneuvering rivals in the market, competitive simplicity is difficult to sustain because it allows rivals to imitate a firm's core competencies more easily. Thus, while it is difficult for a firm to compete using competitive repertoire simplicity, if a firm is able to do so because of its underlying resources and capabilities, it is able to convey information about their core competencies to the market more clearly. This information can be used by multiple potential acquirers to better understand how such resources and capabilities could be integrated with their own to produce potential synergies. Further, simple patterns of stimuli contain readily identifiable core patterns and thus enable outsiders to "grasp a pattern without having to understand all relationships among constituent elements" (Rindova et al., 2010: 1478). Thus, the difficulty of engaging in competitive repertoire simplicity as a signal, coupled with the benefit of simplicity as a gestalt property for enhancing holistic processing and associated positive buyer interpretations, causes for competitive simplicity to reduce information asymmetries and engender positive evaluations from multiple potential acquirers thus creating pressure for higher offered premiums. Therefore, I suggest:

Hypothesis 1: Target firm competitive action sequences exhibiting high simplicity will be positively associated with acquisition premiums.

***Competitive Similarity*.** A firm engaging in competitive similarity is conforming to the competitive norms within an industry. The benefits of competitive similarity for target firms engendering higher acquisition premiums are largely twofold. First, if a firm is able to effectively compete within the expectations of an industry, it is likely that they have an advantageous market position, either in product markets, or strategic factor markets, or possibly both (Barney, 1986). Such a position in a strategic factor market suggests that a firm has some underlying capabilities in accurately understanding and predicting the value of inputs such that they can obtain the inputs from the market for less than the value to the firm. Similarly, an advantageous position in the product market might suggest that a firm has benefits of a strong distribution network, or a high reputation in consumers' minds – both valuable intangible assets that can be difficult to imitate or substitute (Dierickx & Cool, 1989). Further, there is a strong stream of research in operations management that suggests the capability of a firm to manage its supply network is valuable, rare, inimitable, and nonsubstiutable, yielding an advantageous market position and competitive advantage (e.g., Dyer & Nobeoka, 2006; Lavie, 2006). Thus, a firm exhibiting competitive similarity may not have a need to engage in deviant actions to generate and capture value because the firm occupies a superior position within current markets.

Second, some research suggests that employing strategic consistency in competitive actions over time is linked to long-term organizational survival (Lamberg, Tikkanen, Nokelainen, & Suur-Inkeroinen, 2009). Specifically, Lamberg and colleagues (2009) suggest that competitive actions enhance firm survival when they are consistent both with a firm's own history and with the environment. Thus, strategic consistency suggests both an effective competitive strategy (Porter, 1980) and an ability to adapt to external changes at a rate which is concurrent to the business context (Eisenhardt & Brown, 1998). Further, the benefits of conforming to competitive norms may be dependent on a firm's context. Specifically, for smaller companies within well-defined markets, nonconformity was found to be associated with decreased financial performance (Miller & Chen, 1996b). Other recent work has suggested that firms with strong positions take conservative or expected actions in established markets in order to preserve the status quo (Chen, Katila, McDonald, & Eisenhardt, 2010)

Despite the benefits for increasing acquisition premiums, engaging in competitive similarity has costs associated with the difficulty in building and maintaining a competitive advantage. Indeed, a central tenet in much strategy literature is that there is value in strategic differentiation (Porter, 1980). Specifically, Penrose (1959) suggested that it is in the heterogeneity of actions that gives each firm a unique character and allows it to provide different kinds of services. These ideas have been substantiated in competitive dynamics empirical research with findings suggesting benefits of engaging in deviant actions. Specifically, deviance has been found to be

associated with higher performance (Ndofor et al., 2011), higher market returns (Ferrier & Lee, 2002), and slower response times from rivals (Chen & Miller, 1994).

Similar to previous arguments, the difficulty for a firm to compete and maintain a competitive advantage using a competitive repertoire characterized by similarity creates a high cost for firms that do not have the advantages of underlying resources and capabilities sustaining a superior market position. Thus, as a signal, the gestalt property of similarity in a competitive repertoire creates a separating equilibrium such that there are benefits for high quality firms to engage in such behaviors, but the costs are such that low quality firms are unable to do the same. In other words, if a firm competes using competitive repertoire similarity, it is able to send a signal to multiple potential buyers about the underlying sources of its advantages (such as supplier or distribution networks) and its ability to protect this advantage despite outsiders' ability to identify the source of the advantage. This information could be used by multiple potential acquirers to better understand how these sources of advantage might be transferred to their firm and be integrated to generate synergies.

Following previous logic, competitive repertoire similarity aids in outsiders interpreting a firm's underlying resources and capabilities and thus may make it an attractive target to multiple buyers. By engaging in expected types of competitive actions, firms with competitive similarity are easily compared to rivals within an industry aiding in outsiders' understanding and thus potentially engendering positive evaluations by multiple potential acquirers. Due to competitive bidding pressure felt by buyers because of a target's potential broad appeal, premiums are likely to increase.

Thus, competitive simplicity reduces information asymmetry in the market and can lead to positive evaluations from multiple potential acquirers and increase premiums offered. Stated formally:

> *Hypothesis 2: Target firm competitive action sequences exhibiting high similarity will be positively associated with acquisition premiums.*

***Competitive Predictability*.** The predictability of a competitive repertoire captures the timing or rhythm of competition across time periods. It is associated with the ability of rival firms to anticipate the types of actions taken within a sequence (Rindova et al., 2010). Similar to similarity and simplicity, much prior research in management has found several disadvantages for engaging in predictable competitive behavior. Specifically, prior work has suggested the value of inter-temporal heterogeneity of strategy (Gimeno & Woo, 1996; Jacobson, 1992). Further, in competitive dynamics research, unpredictable competitive sequences have been found to lead to higher firm performance (Ferrier, 2001) and are associated with abnormal stock market returns (Ferrier & Lee, 2002).

These disadvantages create a high cost for competing with a predictable strategy. However, there are also benefits to engaging in rhythmic strategic competitive decisions, such as entering or exiting markets, building capacity, or forming strategic partnerships, though previous research has often explored these benefits internally in a firm. Some work suggests that rhythm helps managers plan their progress in strategic decision making, such as with competitive moves, and enables them to stay proactive instead of

reactive (Eisenhardt, 1999). Further, the familiarity of competitive sequences may reduce the time necessary for top executives to decide to engage in competitive activity. Specifically, executives may be able to "quickly conceive of, decide on, and implement attacks … that are carried out in a predictable manner" (Ferrier, 2001: 872). Therefore, engaging in predictable competitive sequences may enable a firm to more effectively utilize managerial time.

Second, predictability, or cross-time similarity, allows for multiple outside observers to extend and extrapolate particular sequences as the observed order of the components is expected to continue in subsequent periods (Ariely & Carmon, 2000; Rindova et al., 2010). In other words, a predictable competitive sequence enables many different outsiders to anticipate what competitive moves may be forthcoming by extrapolating from previous sequences. This could enable prospective acquirers to anticipate how a target firm is planning to transform and leverage its resources in the market. By anticipating how a target will generate and capture value from its underlying resources and capabilities, buyers could use this information to understand how such activities could be recombined within their own firms to generate synergies. Thus, by facilitating pattern perception and sensemaking, predictable competitive sequences may lead to higher evaluations and increased interest by multiple potential buyers. This in turn creates a perceived competitive pressure amongst buyers for the target firm that may lead to higher acquisition premium offers. Stated formally, I suggest:

Hypothesis 3: Target firm competitive action sequences exhibiting high predictability will be positively associated with acquisition premiums.

Moderating effects of Firm Relatedness and Environmental Dynamism

The previous hypotheses share a foundation that suggests that competitive repertoire gestalt properties can be strong signals that may ease the interpretation and understanding of target firm resources and capabilities by multiple acquirers and thus enhance premiums due to perceived competitive pressures by buyers. However, the salience of gestalt properties is largely dependent on outsiders' ability to correctly and easily interpret all of the available information about a target's quality, transferability, and synergy. This section explores how the efficacy of these competitive repertoire gestalt properties varies based on acquirer and environmental characteristics.

***Target and Acquiring Firm Relatedness*.** The relatedness of target and acquiring firms is one of the most studied predictor variables in M&A research (Hitt et al., 2012). Despite the high prevalence of this topic, empirical results remain mixed. Some findings have suggested that greater relatedness leads to greater M&A performance (Finkelstein & Haleblian, 2002) and unrelatedness leads to lower performance (Hoskisson, Hitt, Johnson, & Moesel, 1993). Other work has suggested that both related and unrelated targets and buyers can lead to higher performance (Seth, 1990). Finally, some studies suggest no relationship exists (Singh & Montgomery, 1987) or that the nature of the relationship is curvilinear instead of liner (Palich, Cardinal, & Miller, 2000). Finally, a more recent argument proposes that this relationship may be tenuous because a buyer

may be choosing to engage in more unrelated acquisitions due to core industry decline, confounding performance effects (Park, 2003).

In attempts to better understand such mixed findings, more recent research has begun to explore the relationship between acquiring and target firm relatedness and innovation outcomes in M&As. Specifically, the relatedness of a buyer and a target's technological knowledge predicts M&A innovation performance (Cloodt, Hagedoorn, & Van Kranenburg, 2006; Cassiman, Colombo, Garrone, & Veugelers, 2005; Hagedoorn & Duysters, 2002). This is suggested to occur because too much similarity may reduce the acquirer's opportunities for learning (Hitt, Hoskisson, Johnson, & Moesel, 1996). However, if the knowledge is too dissimilar, then buyers are unable to assimilate and integrate target firm knowledge decreasing performance (Cloodt et al., 2006). Thus, complementarities are found to be better than similarities in firm relatedness for innovation performance after M&As (Makri, Hitt, & Lane, 2010). Overall, while this stream of research is focused on innovation outcomes instead of premiums, it provides strong insights regarding how acquiring firms can evaluate a target's intangible resources and capabilities for potential synergies.

This work on acquirer and target firm relatedness in M&As extends to acquisition premiums because the more unrelated the corporations are to each other, the more difficulty acquirers may have in evaluating a target firm. Because of the differences between acquirers and targets in unrelated acquisitions, buyers may not be able to apply its industry-specific knowledge (Haleblian & Finkelstein, 1999). Specifically, Haspeslagh and Jamison (1991: 54) suggest that "the farther a potential

acquisition candidate is form [an acquiring] manager's experience base, the less capable he or she will be of asking the right questions or searching for the right information." Thus, in more unrelated acquisitions, buyers may be less able to understand a target's underlying resources and capabilities. This uncertainty on the part of the buyer may increase its search for patterns and holistic properties in order to increase its understanding of complex and unfamiliar markets (Witson & Galinsky, 2008).

Further, separate from being unable to apply current industry-specific knowledge to evaluate an unrelated target, such targets may even represent unfamiliar methods of value creation (Hoskisson & Hitt, 1994; Singh & Montgomery, 1987). The transformation of resources and capabilities to generate and capture value by the target may be entirely different than the processes used within buying firms. While this creates an opportunity for novel recombinations of such resources and capabilities generating new value (Barney, 1986; Dierickx & Cool, 1989) the ability to do so effectively remains exceedingly difficult as evidenced by the relatively weak performance of M&As over time (King et al., 2004). Together, this suggests that when a target and potential acquirers are unrelated, the potential for creating synergies is even more tenuous (Anand & Singh, 1997; Balakrishnan, 1988; Singh & Montgomery, 1987). Thus, the greater the unrelatedness between buyers and a target, the more difficulty buyers will have in understanding a target's underlying resources and capabilities and in evaluating how such resources may be transferred and used to generate synergies. Therefore, the value for patterns and holistic processing that can reduce information asymmetries and such

uncertainties on the part of unrelated buyers is even greater for an unrelated buyer and target.

In summary, the greater the unrelatedness of a target and potential acquiring firms, the more difficult it is for buyers to evaluate the quality, transferability, and, perhaps most importantly, the potential synergies of a target's underlying resources and capabilities. Further, because of the high uncertainties in unrelated acquisitions, buyers may be more likely to seek and see patterns in signals such as competitive actions because it is a compensatory mechanism that can restore feelings of control (Witson & Galinsky, 2008). This seeing and seeking of patterns coupled with the tendency to summarize and evaluate extended experiences (such as the due diligence process in M&As) (Ariely & Carmon, 2000) may increase the importance of gestalt properties for increasing processing fluency and thus positive evaluations of the target among multiple buyers. The broad desirability of such a target among multiple buyers, whether they are related or unrelated, may in turn increase the competitive pressure felt by potential buyers which can positively influence premiums offered. Thus, the relatedness of target and acquiring firms in a transaction is expected to influence the salience of gestalt competitive properties and thus the general desirability of a target and resulting acquisition premiums such that the more unrelated the acquisition, the greater the positive influence of competitive gestalt properties on acquisition premiums.

Hypothesis 4: The relatedness of the buyer and target firms negatively moderates the positive relationship between target firm competitive action sequences exhibiting high (a) simplicity, (b) similarity, or (c) predictability and acquisition

premiums such that the relationship between sequence (a) simplicity, (b) similarity, or (c) predictability and premium becomes less positive where the buyer and target are more related.

Environmental Dynamism. Environmental dynamism represents change in an environment that is hard to predict and that heightens uncertainty for key organizational members (Dess & Beard, 1984). In later work dynamism is seen to primarily reflect volatility and instability (Keats & Hitt, 1988), though other dimensions include velocity, complexity, ambiguity, and unpredictability (Davis, Eisenhardt & Bingham, 2009). A key element in dynamism is not simply the presence of change in an environment, but the lack of a discernable pattern in the change (Mintzberg, 1979).

Uncertainty in an environment may influence acquisitions in a variety of ways. Overall acquisition activity may be reduced because the value of new resource combinations may be in doubt for buyers (Hoskisson & Hitt, 1990). However, other research has suggested that uncertainty may increase the likelihood of acquisitions over other forms of collaboration such as licensing agreements (Schilling & Steensma, 2002). Further, acquiring firm characteristics may differentiate the impact of environmental characteristics. Specifically, Bergh and Lawless (1998) found that highly diversified firms were more likely to pursue acquisitions in increasing environmental uncertainty. In fact, target firms have been found to have greater acquisition likelihood in dynamic environments (Heeley, King, & Covin, 2006).

In research specifically focused on knowledge based resources and research and development (R&D), such intangible resources and capabilities have been shown to have greater value in dynamic versus stable environments (Miller & Shamsie, 1996). Specifically, the use of such resources and capabilities for innovation may be strategically necessary for firms facing dynamic environments (D'Aveni, 1994) because such investments can enable firms to cope with the rapid and unpredictable pace of change in dynamic environments (King, Covin, & Hegarty, 2003). In fact, dynamic environments have been suggested to require firms to sporadically or continuously change their resource and capability profiles in order to compete (Rindova & Kotha, 2001).

Further, dynamic environments increase the difficulty for a firm to understand the cause-effect relationships between internal resource activities and value creation (Reed & DeFillippi, 1990). Specifically, dynamism causes managers to continuously redesign capabilities across the firm because of changes in the market and in customer needs (Sirmon et al., 2007). In fact, firms need to create a stream of competitive advantages because the value of current advantages erodes quickly and is rarely sustainable in dynamic environments (D'Aveni, 1994; Eisenhardt, 1999). Thus, because of the changes occurring within a firm in a dynamic environment, potential acquirers may face greater uncertainty in evaluating potential synergies from new resource combinations (Hoskisson & Hitt, 1990).

The increased uncertainty associated with dynamic environments may increase the salience of gestalt properties for multiple potential acquirers and thus may influence acquisition premiums. Previous work on pattern perception and holistic properties in psychology suggest that the salience of gestalts increases in highly uncertain environments (Whitson & Galinsky, 2008). Further, work in management on sensemaking theory suggests that uncertain environments can trigger sensemaking behavior (Weber & Glynn, 2006; Navis & Glynn, 2011). Specifically, Rindova and colleagues (2010) found that in markets characterized by high ambiguity and uncertainty, gestalt properties of competitive sequences increased the positive evaluations of investors. Thus, I suggest that gestalt properties may engender more positive evaluations from multiple outsiders, especially in highly uncertain or ambiguous environments by increasing processing fluency and reducing information asymmetries for many potential acquirers.

While the increasing importance of gestalt properties for multiple potential buyers in dynamic environments may increase premiums, the difficulty in maintaining such competitive repertoire characteristics may also increase in dynamic environments. In other words, the costs of engaging in simple, similar, and predictable competitive behaviors may be increased in dynamic environments. However, because of the increased costs of such competitive behaviors, it makes it even more difficult to decouple the gestalt characteristics from underlying resources and capabilities. This in turn may increase the strength of such gestalt signals for multiple potential buyers. Thus, stated formally,

Hypothesis 5: Environmental dynamism positively moderates the positive relationship between target firm competitive action sequences exhibiting high (a) simplicity, (b) similarity, or (c) predictability and acquisition premiums such that the relationship between sequence (a) simplicity, (b) similarity, or (c) predictability and premium becomes more positive in more dynamic environments.

CHAPTER IV

METHODOLOGY

Sample

The sample for this study is comprised of acquisitions of public firms that recently underwent an initial public offering (IPO). By focusing on public targets I am able to collect consistent accounting and financial information for each firm, thus allowing the development of a reliable measure of premium. Further, by focusing on firms that have recently undergone an IPO, I am able to focus on target firms that are generally considered to be entrepreneurial, high-growth firms within their industries and are likely to be considered as targets by multiple potential acquirers due to their high future growth opportunities and low, if any, takeover defenses (Field & Karpoff, 2002).

For the first step in my research design I constructed a base sample of newly public firms that were acquired by compiling all completed acquisitions with announcements occurring between 2001 and 2011 using the *Thomson One* database, which provides detailed information on firms' IPO and acquisition activities. Following precedent in acquisitions research, the sample is restricted to acquisitions that are completed with 100 percent ownership of the acquired target, and were undertaken by North American acquirers representing all major industry sectors (Schijven & Hitt, 2012). Next, I merged these data with *Thomson One's* IPO data to identify all acquired firms that went public within five years prior to the acquisition announcement (e.g., Field & Karpoff, 2002; Reuer et al., 2012). Following previous research using IPO firm

samples, I excluded transactions associated with real estate investment trusts (REITs), closed-end mutual funds, unit offerings, spin-offs, leveraged buyouts (LBOs), and offerings by firms in the financial services sector in order to focus the sample on firms going public for the first time, instead of various equity offerings (Reuer et al., 2012).

In order to accurately test my hypotheses, it is necessary to use a time frame in which targets' action sequences are unrelated to an IPO but may be influencing potential acquirers. Thus, to reduce any potential confounding actions taken by the firm as part of its IPO, all acquisition announcements must occur at least one year after the IPO to be included in my sample. This restriction allows me to capture action sequences for a full year, a standard time frame for competitive repertoires (e.g., Miller & Chen, 1996; Ndofor et al., 2011), prior to an acquisition announcement. As such, my final sample consists of target firms that were acquired between 2001 and 2011 and underwent IPO within the previous five years from the acquisition announcement.

Second, I used the *RavenPack News Analytics* database to collect firm-level action data from 2000 to 2010, which corresponds to a year preceding the acquisition announcement. This database uses proprietary algorithms to quantify news articles and press releases from the *Dow Jones Newswire, Wall Street Journal,* and *Barron's*. The *RavenPack* database creates a time-stamped firm-level entry any time a company is mentioned in one of these news outlets. While relatively new in its use in management research, *RavenPack* has been found to produce similar descriptive statistics of strategic and tactical actions as previous competitive dynamics research utilizing content analysis

of releases gathered from the *Lexis-Nexus* database (Withers, Sirmon, Tuggle, & Carnes, 2015).

Finally, I supplemented these acquisition and action data with firm- and industry-level financial information from the *CRSP* and *Compustat Fundamental Annual* databases. In summary, my final sample includes target firms of completed North American acquisitions that were announced between 2001 and 2011 and have undergone IPO within the previous five years of the announcement. These criteria allow me to capture annual action repertoires of target firms after IPO and for at least one year prior to the announcement. After accounting for missing data, my final sample size consists of 129 unique acquired target firms.

Measures

Dependent Variable. *Acquisition premium* is calculated as the percentage difference between the purchase price paid per share by the acquirer and the target's share price one week prior to the acquisition announcement. Previous research has examined premiums based on a range of time frames prior to announcement, from four weeks prior (Reuer et al., 2012) to the day of announcement (Laamanen, 2007). Because the goal is to minimize possible other influences on stock price while also capturing any increases due to announcement anticipation by investors, I chose the one week time frame (Schijven & Hitt, 2012). Robustness checks against 1 day and 4 week timelines were also done and are discussed in the results section.

Independent Variables. Competitive actions are externally-directed, specific, and observable moves initiated by the focal firm in order to enhance its competitive position (Ferrier et al., 1999; Smith et al., 1991). Most commonly these actions are categorized by researchers for use in developing repertoire characteristics. I followed a classification system using the *RavenPack* categories that is most similar to action categories used in previous research resulting in eight action categories: acquisitions, new product actions, capacity related actions, legal actions, marketing actions, market expansion actions, pricing actions, and strategic alliances (Connelly, Tihanyi, Carnes, & Ferrier, 2015; Ferrier et al., 2001; Smith et al., 1991; Rindova et al., 2010). For example, if the focal firm engages in a lawsuit as a plaintiff, that action would be characterized as a legal action. Similarly, if a firm opens, closes, or sells a facility, the action would be categorized as a capacity-related action.

The primary predictor variables in this study are gestalt characteristics of competitive repertoires: simplicity, similarity, and predictability. Following previous research on competitive repertoires, these characteristics were computed for a time frame of one year (e.g., Ferrier, 2001; Ndofor et al., 2011). *Competitive simplicity* measures the heterogeneity of actions in a firm's portfolio in a given year. Following Ferrier (2001), Ndofor et al. (2011), and Ndofor, Sirmon, and He (2014), I calculate simplicity using a Herfindahl-type index as represented below:

$$Competitive\ Simplicity = \sum_{i} P_i^2$$

where P_i is the proportion of the i^{th}-category of competitive actions. Higher values represent firms that utilize a narrower range of actions and thus a simpler competitive

repertoire; lower values represent firms with a broader range of actions and thus a more complex repertoire.

Competitive similarity represents the extent to which a firm's portfolio of actions for a given year was similar to those of its competitors. Calculated as the inverse of Ndofor et al.'s (2011) competitive deviance (i.e. dissimilarity), competitive similarity is the sum of squared difference in proportions of categories of competitive actions between the focal firm and the industry mean:

$$Competitive\ Similarity = 1 - \sum_{i}(P_i - \overline{P}_i)^2$$

where P_i is the proportion of the i^{th}-category of competitive action for the focal firm and $\overline{P}_i$ is the industry mean proportion of the i^{th}-category of competitive action. Higher values represent repertoires that are more similar to the industry norms whereas lower values represent repertoires that are more dissimilar, or deviant, from industry norms.

Competitive predictability represents the degree of uncertainty in anticipating a future event. It is commonly operationalized by using optimal matching analysis to calculate Levenshtein distance scores (Ferrier, 2001; Rindova et al., 2010). This analysis calculates the need, or cost, of insertions, deletions, or substitutions in order to make one sequence identical to another. These value of these changes to make one sequence identical to another are referred to as INDEL costs. The most common and objective assignment of INDEL costs is 1 for an insertion or deletion, and 2 for a substitution. Because these distance scores are subject to differences in the length of competitive action sequences, I use a log transformation to normalize the variable for analysis. I also

explore the robustness of my models by using the standardized distance scores and an alternative measure for unpredictability, the Shannon entropy index, in the supplementary analyses section.

Moderator Variables. *Firm relatedness* captures the industry similarity between the target firm and the acquiring firm. I calculated firm relatedness following the traditional SIC code-based measure of relatedness. While this measure is admittedly coarse grained, it is the most commonly used operationalization of target and acquirer firm relatedness in the acquisition literature in the most recent ten to fifteen years (e.g., Haleblian & Finkelstein, 1999; Laamanen & Keil, 2008). Thus, following previous work, firm relatedness will be measured using a the three-point ordinal scale, with a value of 2 assigned if the target and acquirer share the same three-digit SIC code, 1 if the firms share the same two-digit but not the same three-digit code, and 0 if the target and the acquirer do not share a two-digit SIC code (Haleblian & Finkelstein, 1999; Finkelstein & Haleblian, 2002; Laamanen & Keil, 2008; Schijven & Hitt, 2012). *Environmental dynamism* captures the level of change or turbulence in an environment. It is calculated as the standard error of the regression of sales over time divided by mean industry sales (Boyd, 1995; Keats & Hitt, 1988).

Control Variables. I include a number of control variables that may potentially influence acquisition premiums and bias my results. These controls also serve to guard against potential issues of endogeneity (Studenmund, 2010) and specifically may help avoid

spurious findings (Schijven & Hitt, 2012). To do so, these controls were selected such that, based on previous work, they may be expected to influence competitive activity and premiums.

First, I control for a variety of firm-level variables. Previous work has found that prior performance of the target and of the acquirer may influence the premium (Barkema & Schijven, 2008). Also, a target's prior performance may influence its competitive repertoires by either enabling or restricting the ability to engage in various actions (Ferrier, 2001; Ndofor et al., 2011). Thus, I control for both *Target Performance* and *Acquirer Performance* by measuring the firms' profitability in terms of return on assets (ROA) for the twelve months prior to the acquisition announcement. *Target Firm Size* may influence acquisition premiums negatively due to decreasing gains in productivity of the target's assets (e.g. Beckman & Haunschild, 2002) and was controlled using the measure of the natural log of the target firm's total assets. The time between IPO and acquisition may influence the information available to acquirers and thus affect premiums, so *Time Since IPO* was controlled using the number of years between the target's IPO and the acquisition announcement.

Various characteristics of an acquisition may also affect premiums and thus were controlled. *Deal Size* may influence acquisition premiums (Beckman & Haunschild, 2002; Reuer et al., 2012) and was measured as the natural log of the transaction value. Previous evidence suggests that a size bias may exist for acquisitions such that acquirer gains tend to be greater when the target is large, thus possibly influencing premiums (Haleblian & Finkelstein, 1999). Therefore, following tradition in the acquisition

literature, the *Relative Size* of the target to the acquirer is also included as a measure of the ratio of the target's total assets to the acquirer's total assets (Laamanen & Keil, 2008). Also, premiums have been found to vary according to the method of payment used because stock payment can be a signal of a higher risk deal than cash payment. Thus, *Payment Method* is captured as a three-point ordinal scale where 1 represents a cash only sale, 2 represents a cash and stock sale, and 3 represents a stock only sale (Schijven & Hitt, 2012). The presence of investment advisors by either the target or the acquirer may also influence acquisition premiums. Thus, I control for the number of *Target Investment Advisors* and the number of *Acquirer Investment Advisors* as a count of external advisors present as reported by Thomson One (Schijven & Hitt, 2012).

While I examine the moderating role of environmental dynamism, I also control for the other environmental dimensions. *Munificence* captures the availability of resources in a focal industry. Previous evidence suggests that the munificence of an environment may affect the prevalence and the performance of acquisitions (Wan & Yiu, 2009). This work suggests that in more munificent environments, premiums may be higher as compared to less munificent environments. Therefore, I control for environmental munificence as a measure of the log-transformation of net sales for each firm in a series of five-year panels (Keats & Hitt, 1988). *Complexity* captures the inequalities among rivals within an industry and is positively associated with uncertainty (Boyd, 1995). Further, complex environments are associated with greater information-processing requirements for firms (Dess & Beard, 1984) which may influence the salience of gestalt characteristics. Following previous work, this variables is measured

using a Herfindahl index (Boyd, 1995). Differences in premiums have also been found to vary if the industry is high- or low-technology, with premiums being higher in high-technology industries (Laamanen, 2007; Reuer et al., 2012). Industries defined with two-digit SIC codes of 28, 35, 36, 38, 48, 73, 80, and 87 are regarded as high-technology industries (Laamanen, 2007). Thus, *High-Technology Industry* is equal to 1 if a target firm operates in one of these defined industries, and 0 otherwise.

Finally, because I analyze panel data, I include year fixed effects to control for the unobserved heterogeneity (Certo & Semadeni, 2006) further reducing potential endogeneity concerns (Studenmund, 2010; Schijven & Hitt, 2012).

Analyses

My multi-industry data contains a nested structure such that there are multiple firms present in the sample within a single industry. Because competitive norms and premiums vary across industries (Ferrier, 2001; Laamanen, 2007), it is important to account for both within-industry and between-industry differences in the data. Further, due to the nesting of the data, the observations cannot be assumed to be independent from one another, thus violating one of the assumptions of ordinary least squares regression. For these reasons, I use hierarchical linear modeling (HLM) to estimate my theoretical model.

HLM provides a statistical technique for investigating relationships across different hierarchical levels (Hofmann, 1997). In other words, HLM allows for the influence of industry characteristics to be accounted for in firm-level variables, such as

acquisition premium. More specifically, HLM controls for potential autocorrelation and heteroskedasticity by recognizing the partial interdependence of observations and explicitly modeling both firm- and industry-level residuals. To do this, HLM simultaneously estimates two models: one modeling the relationships within each of the lower level (firm) units, and a second model accounting for how these relationships vary between groups (industries) (Hoffmann, 1997). Thus, HLM allows me to accurately accommodate the non-independence of my data while also efficiently estimating both within-industry and between-industry effects. The statistical package Stata 12 is used for all analyses.

CHAPTER V

RESULTS

Results

Table B1 presents the descriptive statistics and correlations for the dependent, independent, and control variables. The average one week premium in my sample is 42.49 percent, with a variance of 62.47 percent.

Variance inflation factor (VIF) scores were calculated using ordinary least squares regression (OLS) for my full model to check for multicollinearity. All individual VIF scores are well below the common threshold of 10, with the highest VIF score at 5.57 for the first year fixed effect, and all other variables below a more conservative guideline of 5[1]. The average of all VIF scores is 2.79. These results suggest that multicollinearity is not a problem; however, all independent variables used in creating interactions terms were mean-centered to ease interpretations and reduce non-essential multicollinearity (Dalal & Zickar, 2012). Further, all significance tests in the models reflect a two-tailed test.

Using OLS regression again, further diagnostics were run to test for the presence of heteroskedasticity. The -hettest- procedure as a postestimation test (Stata, 2012) rejected the null hypothesis of constant variance in my errors and indicated the need to use robust standard errors to correct for heteroskedasticity in all models.

[1] An alternative model using a categorical year control variable, as opposed to dummy variables for year fixed effects, had VIF scores all below the conservative threshold of 5 with an average VIF of 1.78. The results were substantially unchanged as reported in Table B4, Model 4.

Table B2 presents the results of the HLM models testing hypotheses 1-5. The analyses were done and are presented in a step-wise fashion in Models 1 – 8. Model 1 presents the control variable model, while Model 2 presents the main effects model. Model 3 presents all interaction terms, while Models 4 – 8 present the main effects model and some of the interaction terms, broken up by the variable of focus. For example, Model 4 presents all of the competitive similarity interactions, while Model 7 presents all of the dynamism interactions.

Hypothesis 1 states that there is a positive relationship between competitive simplicity and acquisition premium. In Model 2 of Table B2, the coefficient of competitive simplicity is positive and statistically significant (39.941, $p < 0.01$), providing support for hypothesis 1.

Hypothesis 2 states there is a positive relationship between competitive similarity and acquisition premiums. While the coefficient for competitive similarity in Model 2 of Table 2 is statistically significant ($p < 0.05$), it is also negative (-27.824) which is in the opposite direction of that hypothesized. Thus, hypothesis 2 does not receive support.

Hypothesis 3 states there is a positive relationship between competitive predictability and acquisition premiums. In Model 2 of Table B2, the coefficient for competitive predictability is insignificant ($p > 0.10$), thus hypothesis 3 does not receive support.

Hypothesis 4a, 4b, and 4c suggest that the relatedness of the buyer and target firms negatively moderates the positive relationships between competitive simplicity, similarity, and predictability and acquisition premium such that these relationships

become less positive when firm relatedness is greater. Model 3 in Table 2 provides the most conservative test of all interaction hypotheses, and none of the interaction coefficients between competitive similarity, simplicity, predictability, and firm relatedness are statistically significant ($p > 0.10$). Further, in Models 4 – 6, the interaction coefficients between the competitive repertoire characteristic and firm relatedness are also statistically insignificant. Finally, in Model 8, including only the firm relatedness interaction terms, the coefficients are statistically insignificant ($p > 0.10$), except for the interaction between competitive similarity and firm relatedness which is negative and marginally statistically significant ($p < 0.10$). Thus, with no coefficients for interaction terms statistically significant across any of the models, hypothesis 4b and 4c are not supported. For hypothesis 4a, with only one interaction term being marginally statistically significant in Model 8, and the remaining interaction coefficients being statistically insignificant in the more conservative Model 3, I conclude that the results also do not provide support for hypothesis 4a.

Hypothesis 5a, 5b, and 5c suggest that environmental dynamism positively moderates the positive relationships between competitive simplicity, similarity, and predictability and acquisition premium such that these relationships become more positive when dynamism increases. Model 3 in Table 2 provides the most conservative test of all interaction hypotheses, and none of the interaction coefficients between competitive similarity, simplicity, predictability, and dynamism are statistically significant ($p > 0.10$). Further, in looking at Models 4 – 6, the interaction coefficients between the competitive repertoire characteristic and dynamism are also statistically

insignificant. Finally, in Model 7, which includes only the interaction terms for dynamism, none of the interaction coefficients are statistically significant. Thus, hypotheses 5a, 5b, and 5c do not receive support.

Supplementary Analyses

Alternative Dependent Variable Operationalization. I chose a one week time frame for my calculation of acquisition premium in order to minimize possible other influences on stock price while not capturing any influence from early information regarding the acquisition announcement. However, I also tested my full model using acquisition premiums calculated both 1 day and 4 weeks prior to announcement. Identical to my main analysis, all models use HLM analysis and have robust standard errors.

Table B3 presents the results of these robustness checks with Model 1 serving as the main effects model at 1 week. Model 2 presents the results for acquisition premiums calculated 1 day prior to announcement and Model 3 presents premiums calculated 4 weeks prior to announcement. Competitive simplicity remains positive across all of the models and is statistically significant ($p < 0.01$) in Model 1 and Model 2. Conversely, competitive similarity remains negative across all three models and is statistically significant ($p< 0.05$) in Model 1 and Model 3. Competitive predictability, firm relatedness as a moderator, and environmental dynamism as a moderator, all remain statistically insignificant ($p > 0.05$) across all of the models. Thus, my results remain relatively consistent across various operationalizations of acquisition premium, but early and later announcements seem to be influenced by factors external to my model.

Overspecification Sensitivity Analysis. After all of my sample criteria were met and missing data were excluded, the final sample size was 129 firms. Considering I have 12 control variables, as well as 10 year fixed effects controls, in addition to my 5 independent variables, it is possible that I might be overspecifying my model. Specifically, there are 27 total variables in the model which is above the rule of thumb of 10 observations per variable. Thus, in Table B4 I test a variety of partial models to see the consistency of my independent variables. As done in my main analysis, all models use HLM analysis and have robust standard errors.

First, I test a baseline of only my independent variables with no controls in Model 1. Competitive simplicity remains positive and statistically significant ($p < 0.05$) and competitive similarity is negative and statistically insignificant. Competitive predictability becomes negative and marginally statistically significant ($p < 0.10$).

Next, in Table B4, I compare models using 10 dummy variables for each year (denoted by year fixed effects included, Models 5 – 7) with models that use an alternative time control: one variable, Year, that ranges from 2000-2010, (Models 2-4). Thus, the only differences between Model 2 and Model 5, Model 3 and Model 6, and Model 4 and Model 7, is the use of a single variable year control or year fixed effect controls.

Following the recommendations of Becker (2005), Carlson and Wu (2012), and the recent work of Gamache, McNamara, Mannon, and Johnson (2014), I also tested models using the "when in doubt, leave them out" (Carlson & Wu, 2012: 413) strategy

for control variables (Models 3 and 6). In these models, if a control variable was not significantly related with the dependent variable or was not significantly related with any other study variable, it was left out of the model. Thus, the controls included in these models are time (either categorical or dummy variables), Target Performance, Acquirer Performance, Target Firm Size, Deal Size, Payment Method, and Hi-Tech Industry.

Finally, I tested the full model with all controls using both the single variable year control (Model 4) and the year fixed effects (Model 7). Model 7 in Table B4 is identical to Model 2 in Table B2, the main effect model in the HLM results.

In every model in Table B4, the coefficient for competitive simplicity remains positive and statistically significant, indicating that this result testing hypothesis 1 is robust to possible model overspecification. The negative effects for competitive similarity are largely consistent across the models, but becomes only marginally significant when a single variable year control is used (Models 2 – 4). The coefficient for competitive predictability largely remains negative and insignificant across all models. Thus, I conclude that my results are robust to possible overspecification.

Sample Selection Bias Analysis. It is possible that my sample may exhibit selection bias because not all recent IPO firms choose to be acquired. Sample selection may be an issue if it causes the error to be correlated with an explanatory variable (Wooldridge, 2002). While acquisition premium studies have generally not addressed this concern, there have been a few recent exceptions. Gaspar, Massa, and Matos (2005) did not find evidence of selection bias; and similarly, Reuer et al., (2012) was unable to reject the

null of no sample selection bias, suggesting that selection bias was not a concern regarding the robustness of their results.

To investigate this potential issue I use a two-stage Heckman (1979) model as suggested by Bascle (2008) and Hamilton and Nickerson (2003). A probit first stage model is used to estimate the inverse Mills ratio for the dummy selection variable of a firm being acquired within five years of IPO (1) or not (0). To estimate this model, I collected data on IPO firms in the same industries as firms in my sample that were not acquired within the studied time frame. The variables used in this first stage model to predict acquisition but are not included in the second stage are *Industry M&A Activity* as a count of all acquisitions in a given year and whether or not the target firm was Listed on a *Major Exchange* (NYSE or NASDAQ) (Reuer et al., 2012). The results are presented in Table B5.

While it is common that the second stage model variables are a subset of the selection equation (Hamilton & Nickerson, 2003), in this instance, that is not possible as not all variables used in the second stage model exist for non-sample firms. Specifically, because a variety of my control variables in the second stage equation include acquirer and deal characteristics, these variables do not exist for IPO firms that have not been acquired. Thus, my selection equation uses all control variables that are not acquirer or deal related along with *Industry M&A Activity* and *Major Exchange*. This decision follows previous research that excludes variables in the first stage that are used in the second stage because they are unknown or do not exist for non-sample firms (Mulotte, 2014). While my sample data does exhibit heteroskedasticity and thus I have used robust

standard errors in all previous analyses, for a Heckman two stage analysis, Heckman standard errors must be utilized and are the default for the -heckman- procedure (Stata, 2012). Thus, in the HLM analysis in Model 1, robust standard errors are used, but in the Heckman analyses in Model 2 – 4, Heckman standard errors are utilized.

Further, while I used performance and size measures for the target and acquirer firms for 12 months prior to the acquisition announcement gathered from *Thomson One* database in my main model, in this sample selection model, I use performance and size characteristics obtained from *Compustat* for the year prior to the acquisition announcement. The change from the more precise 12 month prior measure to the less precise, but largely overlapping, fiscal year prior to announcement operationalization for size and performance of IPO firms, is once again for uniformity between acquired and non-acquired IPO firms. Model 1 in Table B5 is identical to the HLM main effects Model 2 in Table B2, except Model 1 in Table B5 uses the fiscal-year prior measurements as opposed to the measurements 12 months prior to the announcement. As seen in Model 1 of Table B5, results are consistent across both types of firm size and performance operationalizations.

Also, due to the panel nature of the IPO firm data and the cross-sectional nature of the acquisition data, I ran a variety of Heckman models to see if the results were robust across different aggregations. Specifically, I collected firm-year data for all firms that underwent IPO between 2000 and 2010, whether or not they were acquired. For non-sample firms (firms that underwent IPO but were not acquired within 5 years), I needed to choose a single firm-year to use for the selection model. Possibly due in part

to the lack of attention sample selection issues have received in acquisition premium research, there were no prior examples to follow in choosing how to simplify my data for the selection model. Thus, I tried a few different models to examine the consistency of my results.

Model 2 presents the results for a Heckman two stage analysis using only the data from a non-acquired firm's fifth year after IPO. In other words, if a firm that underwent IPO was not acquired within 5 years, its data from the fifth year after IPO was used. Model 3 presents results for a Heckman two-stage analysis that the selection variables of non-acquired firms were averaged across their first five years after IPO. Finally, Model 4 shows the results of Heckman two stage model when the non-sample firms were acquired, but not within 5 years. Because non-sample firms were required to be acquired for this model, allowing for a comparison of acquisitions announced within 5 years of IPO versus acquisitions announced more than 5 years after IPO, there are significantly fewer non-sample firms in this analysis than the previous two models.

Regardless of which model is considered, the inverse mills ratio is statistically insignificant in all three analyses. Thus, similar to the findings by Gaspar et al (2005) and Reuer et al. (2012), there is no evidence for selection bias in my sample.

While the results in Table B5 are consistent and most relevant to possible sample selection issues in my sample, I also tried to examine if there were any differences between my sample, which only consisted of completed acquisitions, and acquisitions that were announced but eventually withdrawn. Because I am only examining announced acquisitions, and comparing completed versus failed acquisitions, I use size

and performance data from the 12 months prior to announcement provided by the *Thomson One* database.

Table B6 presents the results of Heckman models comparing failed versus completed acquisitions. Model 1 reports the results for firms that announced within 5 years of IPO but did not complete the acquisition as compared to my sample of firms that announced within 5 years of IPO and did complete the acquisition. Model 2 relaxes the 5 year limit for non-sample firms in order to increase the number of non-sample observations. Thus, Model 2 presents the results for firms that underwent an IPO and announced an acquisition between 2000 and 2010, but not necessarily within 5 years of their IPO, and did not complete the acquisition. My sample remains the same: firms that completed an acquisition that was announced within 5 years of their IPO.

Consistent with results reported in Table B5, across all models the inverse mills ratio is statistically insignificant, suggesting that there is no evidence of selection bias in my sample.

Alternative Measure of Competitive Predictability. The primary results presented in all of the tables use a measure of competitive predictability based on the Levenshtein distance scores from optimal matching analysis. I investigated several alternative measures, but all proved either to show consistent results, or were unsuitable due to severe multicollinearity concerns.

As opposed to using a log transformation of the unstandardized Levenshtein distance score, I investigated using the unstandardized measure without a log

transformation and found the results were substantively unchanged. I also investigated using the standardized Levenshtein distance score, where the distance score is calculated as a proportion of the INDEL costs to the total number of elements in the referent sequence. Again, the results were substantively unchanged.

Finally, I investigated using a completely different measure of unpredictability. While Levenshtein distance scores have been previously used in competitive dynamics research (Ferrier, 2001; Rindova et al., 2010), they are heavily dependent on the assignment of substitution scores (INDEL costs). In other words, researchers must assign a cost to substituting a new product action with a capacity action, or an acquisition action with a pricing action, all with respect to other actions. While it is obvious the cost of substituting a pricing action with a marketing action should be quite low as compared to substituting a pricing action with a legal action, the similarity or difference of such substitutions must be quantified at the discretion of the researcher. Further, this analysis is heavily influenced by the length, or number of actions used in the preceding sequence (t-1) instead of being based upon all possible actions. While I endeavored to use the most neutral and objective assignment of INDEL costs, and used a log-transformation of the measure to reduce the influence of length in my main analysis, some concerns remain with this measure.

Based on the discussion above, the Shannon entropy index may be better suited for measuring competitive predictability than Levenshtein distance scores in this study because it maintains consistency in the gestalt operationalizations as well as removes the subjectivity of substitution costs. The assumption driving the unpredictability behind the

Shannon index is that the greater the range of categories, and the more equally distributed the characters (in this case actions) within the categories, the more difficult it is to predict which category of action will appear next (Connelly et al., 2015; Shannon, 1948). The Shannon index is calculated as follows:

$$S = \sum_{i=1}^{R} p_i \ln p_i \,/\, \ln(i)$$

where p_i is the proportion of competitive actions belonging to the *i*th competitive action category. This index ranges from a high of 1 when all types of competitive actions are equally common and thus most unpredictable and approaches zero as actions become more concentrated and therefore easier to predict correctly. While the Shannon index is similar to a Herfindahl index in that it captures the concentration of categories, as a measure of entropy it specifically is focused on capturing the average unpredictability in a random variable given all possible categories. Using this measure as a base, competitive predictability is calculated using the following formula:

$$Competitive\ Predictability\ = 1 - \sum_{i=1}^{R} p_i \ln p_i \,/\, \ln(i)$$

This operationalization allows for higher values to be associated with greater levels of predictability while lower values are associated with lower levels of predictability. Unfortunately the similarity in variance with a Herfindahl index is too great to make this measure suitable in my models. Specifically, the correlation between the Shannon index and competitive simplicity (calculated using a Herfindahl index) is greater than 0.90 resulting in severe multicollinearity concerns.

Alternative Measure of Firm Relatedness. Despite its use in many prior works (e.g. Haleblian & Finkelstein, 1999; Finkelstein & Haleblian, 2002; Laamanen & Keil, 2007; Schijven & Hitt, 2012), the categorical approach to industry relatedness between acquirer and target is admittedly a coarse grained operationalization for firm relatedness. Specifically, this measure fails to capture the level of diversification for each firm. If an acquirer was heavily diversified, even though it's corporate SIC code may be different than a target's, one of the acquirer's businesses may be much more closely related. Thus, the acquirer may have a better understanding and ability to evaluate the target than the SIC measure would suggest.

To examine this issue further, I calculated an alternative firm relatedness measure by using the difference between the Jacquemin and Berry (1979) entropy diversification measures for the target and acquirer. This measure captures the level of diversity within a corporation and when compared between a target and acquirer, captures the level of difference between the two firms. Total entropy equals 0 for a single business firm and rises with the extent of diversity. In subtracting a target firm's diversification measure from an acquiring firm, the difference is small if both firms share similar levels of diversification and rises with increases in the diversification level differences between the firms.

Table B7 reports the descriptive statistics and correlations for all independent, dependent, and control variables when the diversification operationalization of firm relatedness is used. The average difference in diversification level is 0.31 with a standard

deviation of 0.56. In testing for multicollinearity in my main effects model using this measurement, the VIF scores are high. When the variables used in interactions are mean centered, there are six VIF scores above 10.00, with the highest at 16.59. The average VIF score is 5.58. These scores are well above the accepted threshold of 10, not to mention the more conservative recommendation of 5 as a maximum VIF, and indicate there is an issue with multicollinearity in the model when using the diversification measure of firm relatedness. Despite this concern, the results of the HLM analysis using robust standard errors and the diversification measure of firm relatedness remain consistent with previous findings.

Robustness to Inclusion of Firm Competitive Activity. I also investigated if my results were robust to the inclusion of another control variable, firm competitive activity. This variable is a count of all competitive actions taken by a firm in a given year. Inclusion of this variable allows for any variance associated with the overall total volume of actions to be differentiated from the variance in the patterns of competitive behavior captured by simplicity, similarity, and predictability.

Table B8 presents the descriptive statistics and correlations for my dependent, independent, and control variables, including firm competitive activity. Table B9 presents the HLM results for the control (Model 1), main effect (Model 2), and interaction (Model 3) empirical models. Competitive simplicity remains positive and statistically significant ($p < 0.05$), competitive similarity remains negative and

statistically significant ($p < 0.10$), and competitive predictability remains not statistically significant, leaving the results substantively unchanged from Table B2.

In summary, to test the robustness of my results I investigated alternative measures for acquisition premiums, competitive predictability, and firm relatedness, and found my results to be substantially unchanged across all operationalizations. Further, I investigated if my models might be overspecified and found that the results are robust to using year fixed effects versus a single variable to control for time. Also, in following the "when in doubt, leave it out" control variable recommendations of Becker (2005) and Carlson and Wu (2012), I found my results remain essentially unchanged in the models with the omission of various control variables if they were not significantly related with the dependent variable or had no correlation with any other study variable (Table B4, Models 3 and 6). There was a possibility that sample selection bias might be present in my sample, but multiple different analyses failed to find evidence of such a bias, which is in agreement with previous studies (e.g. Gaspar et al., 2005; Reuer et al., 2012). Finally, I also investigated the influence of another control variable, total firm competitive activity, and found my results to be unchanged.

Overall, the supplementary analyses suggest that the positive and statistically significant finding of competitive simplicity, the negative and statistically significant finding for competitive similarity, and the statistically insignificant finding for competitive predictability are robust across various operationalizations and models.

CHAPTER VI

DISCUSSION AND CONCLUSIONS

In this dissertation, I integrate signaling and holistic processing theories to examine how the sequence characteristics of a target firms' competitive actions over time can influence its acquisition premium. Current research suggests that premiums are largely driven by the acquirer's valuation of anticipated synergies with the target firm (Hitt et al., 2012) which are highly subjective and subject to considerable information asymmetries (Coff, 1999; Reuer et al., 2012). To better understand how these information asymmetries are alleviated, research has focused on signaling theory.

Based on the foundational relationships between the signaler, the signal, the receiver, and feedback, signaling theory has been an important theoretical framework used in research on strategy, entrepreneurship, and human resource management, among others, over the past two decades (Connelly et al., 2011). Despite these many works, overall applications of signaling theory have remained similar and largely cross-sectional in nature. In fact, Connelly et al. (2011) suggest that while the basic components of signaling theory are generally used to explain foundational signaling relationships in the management literature, there is less work "aiming to extend the boundaries of what we know about signaling to develop a more comprehensive theory that scholars might use to explain a broader range of social and organizational phenomena" (Connelly et al., 2011: 56). While signaling theory is dynamic and longitudinal, most signaling studies have examined the effects of individual signals

immediately preceding key decisions. In fact, a key criticism of signaling theory research is the emphasis on signals that act as single "snapshots" (Davila et al., 2003).

However, previous research in holistic processing theory and sensemaking suggests that receivers process information that is not only current, but also historical, and from this often overwhelming amount of available information, search for patterns to enhance their understanding (Weick, 1995; Whitson & Galinsky, 2008). Thus, I suggest that in order to continue to develop our understanding of the signaling process we need to extend the time period of focus from individual signals to sequences of signals transmitted over time.

I develop theory to predict that target firms with competitive action repertoires exhibiting high simplicity, similarity, and predictability will be associated with high acquisition premiums. This logic is consistent with evidence from holistic processing theory and in management research that shows the presence of easily discernable patterns in complex information sequences can increase positive evaluations (Lee & Labroo, 2004; Navis & Glynn, 2011; Rindova et al., 2010). Specifically, I explain that characteristics of competitive repertoires have high visibility, strength, and cost, and thus serve as a signal to convey unique information that is distinct from the information from each individual action. Further, I suggest that the salience of these gestalt competitive repertoire characteristics is influenced by the target and buyer's relatedness and the uncertainty in the environment.

My results support the underlying assertion in my model, that competitive action repertoire characteristics influence acquisition premiums, but I find conflicting effects

depending on the specific characteristics. In particular, I find strong and consistent evidence that target firms exhibiting a simple competitive action repertoire are associated with a premium increase of 40 percent. I also find that target firms with competitive action repertoires similar to other firms in their industry are consistently associated with changes in acquisition premiums, but the relationship is negative. Further, I do not find any moderating effects, suggesting that the salience and interpretability of a target firm's competitive repertoire characteristics are not influenced by environmental dynamism or acquirer and target firm industry relatedness. There are a variety of theoretical and empirical explanations for these specific findings that I discuss in the next section; however, in the remainder of this section I focus on the three primary contributions of the dissertation as a whole.

First, this work extends signaling theory by introducing the idea of gestalt characteristics in signaling sequences over time that can convey information that is distinct from the information sent by individual signals. Focusing on characteristics of competitive action repertoires as signals addresses the concern of frequency or repetition in signaling (Janney & Folta, 2003; Park & Mezias, 2005). Further, by integrating work from holistic processing theory, I show that pattern characteristics can have high visibility. Finally, by specifically focusing on characteristics of competitive action sequences, I demonstrate that these characteristics can have high signal strength due to the reduction in noise and expense of decoupling the signal from the signaling firm's resources and capabilities. Overall, this logic extends previous work in signaling theory that has examined individual signals prior to an event, such as in hiring (e.g. Ehrhart &

Zeigert, 2005; Highhouse, Thornbury & Little, 2007), IPO investment (e.g. Bruton, Chahine & Filatotchev, 2009; Certo, 2003; Zimmerman, 2008), and strategy and stakeholder decisions (e.g. Goranova et al., 2007; Zhang & Wiersema, 2009) by considering current and historical information collectively.

A second major contribution of this dissertation is in exploring contextual contingencies of competitive behavior. Overwhelmingly, current evidence suggests complexity, deviance, and unpredictability lead to positive firm outcomes such as performance (Ferrier, 2001; Ndofor et al., 2011), firm reputation (Basdeo et al., 2006), market share gains (Caves & Ghemawat, 1992), and industry leader dethronement (Ferrier et al., 1999). However, I suggest that while complexity, deviance, and unpredictability may enable a firm to remain ahead of rivals, these patterns obscure the value proposition of a firm that desires to be acquired in the M&A market. I find that in the context of the M&A market, from the perspective of the target firm, engaging in a simple repertoire can lead to a 40 percent increase in premiums received, on average. While I did find the opposite effect for competitive similarity (representing a 28 percent decrease in premiums), this study suggests that patterns of competitive behavior can produce widely varying outcomes depending on the context and motivation of the focal firm.

Third, this work integrates competitive behavior and premium research to contribute important insights to our understanding of target firm behavior in the M&A market. While much of the work in M&A research focuses on buyer characteristics (Haleblian, Devers, McNamara, Carpenter, & Davison, 2009) and learning (Haleblian &

Finkelstein, 1999; Meschi & Metais, 2013), there is a general consensus that the better the selected target fits with a buyer, the greater the acquisition performance (King, Dalton, Daily, & Covin, 2004). However, despite our enhanced understanding of the important role target selection plays in acquisition success, there remains a lack of focus on the target in an acquisition. This perspective has carried over into premium research, as evidenced by the focus on causes of overpayment such as managerial hubris (Hayward & Hambrick, 1997), misrepresentation and opportunism (Balakrishnan & Koza, 1993; Gilson & Schwarts, 2005), and agency issues with intermediaries (Porrini, 2006; Stouraitis, 2003). This dissertation builds on previous studies by Graebner (2009), Heeley et al. (2006), and Reuer and colleagues (Reuer et al., 2012; Ragozzino & Reuer, 2011) by focusing on the influence target firms have in the acquisition process, and specifically how target firms can increase their acquisition premiums. More generally, I build on M&A research by integrating work from competitive dynamics to suggest and find that the characteristics of a target firm's current corporate-level competitive patterns can influence acquisitions premiums.

Specific Hypotheses and Implications

One of the major contributions of this work discussed above is showing the contextual contingencies for competitive repertoire characteristics, specifically in suggesting and finding that these characteristics can have opposite effects for firms in the M&A market from what is currently established in the literature. Specifically, hypothesis 1 suggests that competitive repertoire simplicity is positively associated with

acquisition premiums. This hypothesis is in stark contrast with a majority of the work on competitive repertoires that finds competitive complexity, the inverse of simplicity, to be positively related to a variety of positive firm outcomes (Ferrier, 2001; Ndofor et al., 2011). The significant and positive finding for the relationship between simplicity and premium in this study is robust across a variety of models and remains a large effect, at a 40 percent increase in premium, on average.

This finding has implications for the stream of work on competitive simplicity, finding that evidence for the benefits of engaging in a complex repertoire is not only time dependent (Connelly et al., 2015; Miller, 1993), but also context dependent. This adds nuance to the current literature that overwhelmingly finds the benefits of competitive complexity. Specifically, my finding relates to some of the original work on firm simplicity, referring more broadly to organizational structure and strategy as opposed to focusing only on competitive actions (Miller, 1993), by suggesting that firms engaging in a simple repertoire may experience the benefits of focus in core competencies and strategic (i.e. rare, valuable, nonsubstituable, and inimitable) resources (Barney, 1991; Dierickx & Cool, 1989) that are defensible from being imitated by rivals (Lenoard-Barton, 1992; Lippman & Rumelt, 1982; Prahalad & Hamel, 1990).

Furthermore, when considering the importance of conveying information to a market while simultaneously protecting that information from appropriation by rivals (Ndofor & Levitas, 2004), a simple competitive repertoire offers the benefit of being a visible and strong signal to potential buyers. Thus, my finding provides new insights into

our understanding of competitive repertoires and how firms can simultaneously signal information about value creation and protect their proprietary knowledge.

Hypothesis 2 similarly suggests that another competitive repertoire characteristic, competitive similarity, is also associated with an increase in acquisition premium. However, while the result was significant across many models, it was always in the opposite direction than predicted. In fact, competitive similarity was found to be related to a 28 percent decrease in premium, on average. This finding is surprising considering the benefits of a competitive repertoire pattern for signaling information and increasing processing fluency; however, it may speak to a possible disconnect in my theorizing between reducing information asymmetries and raising acquisition premiums.

In my hypothesis development, I suggest that reducing information asymmetries may lead to an increase in premiums because acquirers would be less likely to engage in premium discounting. However, from a buyer's perspective, reducing information asymmetries simply leads to a better evaluation of a target, which in turn may either increase or decrease the premium. In other words, lower information asymmetries in target selection may help the acquirer select a target more quickly, and possibly increase post-acquisition performance, but lower information asymmetries may not necessarily lead to an increase in premiums. The variance seen in premiums, 62.47 percent in my sample, suggests that while some targets may be underpriced and reducing information asymmetries can increase their premium, the opposite is also likely true. Some target firms may benefit from information asymmetries in the selection process and decreasing those uncertainties leads to a more accurate pricing that reduces premiums.

My results suggest that a target firm exhibiting greater competitive similarity results in a lower premium, likely reflecting a more accurate pricing of the target due to reduced information asymmetries. A firm that exhibits high similarity behaves in accordance with industry competitive norms and thus is offering a value creation capability that is less rare in the industry. Further, potential buyers may be interested in changing the status quo in their new market, and thus may take bold moves and act out of the ordinary for that industry's competitive norms. Chen and colleagues (2010) found that firms seeking to change the status quo in an established market often take bold moves in hopes to disrupt current industry leaders. Similarly, a cornerstone of strategic management research suggests that there is value in differentiation, specifically doing different things, or doing the same things differently (Porter, 1980). Also, Penrose (1959) suggests that it is the heterogeneity of actions taken by a firm that yields each firm's unique character and allows it to provide different kinds of services. In other words, since competitive similarity is measured as compared to the norms in an industry, a potential buyer may be receiving the signal and reducing the information asymmetries, but they value deviance, or doing the same things differently, as reflected in the robust negative relationship between competitive similarity and premium.

As the final direct hypothesis in this study, hypothesis 3 suggests that competitive predictability is positively associated with acquisition premium. Unlike competitive simplicity and similarity, competitive predictability is not consistently significant across the models tested herein. There could be a variety of empirical and theoretical reasons for this result. Empirically, competitive predictability is correlated

with competitive simplicity, at 0.47 (as reported in Table B1). While the VIF scores were well below the thresholds for concerns about multicollinearity, it is possible that some residual multicollinearity exists in the model that could be inflating the standard errors and increasing the possibility of a Type II error. Also, it is possible my model is influenced by low degrees of freedom that might be inflating my confidence intervals which is also associated with Type II error. With 27 variables in my full main effects model, a common heuristic suggests a minimum sample size of 5 to 8 times the number of variables, yielding a recommended sample size of 135. With 129 observations, my model only marginally satisfies this rule of thumb. Relatedly, because of the relatively low number of observations, the entire model might be subject to low power and thus higher Type II error. Specifically, the power for predictability is calculated as 0.26, much lower than the commonly desired 0.80. This calculation was done using the coefficient and standard errors associated with Model 2 of Table B2 and a two-tailed 95% alpha following the recommendations of Scherbaum and Ferreter (2009) for a multilevel model. Thus, the lack of statistically significant findings could be due to high multicollinearity, low degrees of freedom, and low power, all associated with a high Type II error rate, leading to false negatives when in fact there is a relationship between predictability and premium.

Theoretically, competitive predictability may not be associated with acquisition premiums for the same reasons discussed earlier, that reducing information asymmetries may not be related to an increase in premiums. Considering the lack of significant effects for predictability across most of my models, a firm exhibiting competitive predictability

may be reducing information asymmetries, but these reductions may be leading to either an increase or a decrease in premiums across firms, thus washing out any effects seen across the entire sample. Another dependent variable, such as the variability in premiums, might be a better choice to illuminate if competitive predictability is consistently decreasing information asymmetries for potential acquirers.

For example, various measures of post-acquisition performance, such as financial returns and innovation outputs might also illuminate this relationship as lower information asymmetries, such as found with firms exhibiting competitive predictability, should result in better target selection and thus increases in post-acquisition performance and patents. Further, the length of time between when a target firm undergoes an IPO and is acquired may be shorter for a firm with lower information asymmetries through the use of a predictable competitive repertoire. The more predictable the target firm's competitive actions are over time, the less uncertainty there is for buyers regarding the target firm's value proposition, and thus the more quickly buyers are able to evaluate and select the firm as a target. These relationships should remain in a single direction with the decrease in information asymmetries, as opposed to premiums, which may increase or decrease based on the more accurate evaluations afforded with lower uncertainties.

Alternatively, the insignificance of the predictability to premium relationship may be due to the lack of interest of buying firms in allowing the target firm to continue operating as it was prior to the acquisition. Specifically, because of the benefits possible through new synergies, buying firms may anticipate and desire for target firm competitive behavior to change after acquisition. Thus, buyers may be less interested in

evaluating and paying greater premiums for either predictable or unpredictable competitive repertoires, as shown by the insignificance of the relationship between predictability and premium. In other words, acquiring firms may find the repertoire characteristic of predictability irrelevant to their target selection because they expect the competitive actions of the newly integrated firm to change due to new synergies and the buyer's desire to change the acquired target firm's market, regardless of the acquired target firm's prior pattern.

Hypothesis 4a, 4b, and 4c all suggest that the relatedness between the buyer and target firms negatively moderates the positive relationships between competitive simplicity, similarity, and predictability, and acquisition premium. The logic here suggests that as a potential buyer is more similar to a target, it is better able to understand current and historical information about the target, and thus may rely less on the positive evaluations generated through the presence of patterns. Across all models tested these interaction predictions receive no support. While consistent with the logic of my hypotheses, the categorical measure of firm relatedness based on similar SIC codes is coarse grained and may not provide the best operationalization of this variable. In fact, despite its prevalent use in M&A research (e.g., Haleblian & Finkelstein, 1999; Finkelstein & Haleblian, 2002), this measure is not significant in previous acquisition premium models using widely different samples (Laamanen, 2007; Laamanen & Keil, 2008; Schijven & Hitt, 2012).

Theoretically, the lack of support for my moderation hypotheses, and possibly for the lack of statistical significance in previous premium research, could again be due to

lower information asymmetries leading to both higher and lower premiums. In the hypothesis development, I assumed that the more related the buyer and target firms' industries, the more likely the buyer would be able to evaluate and understand the value creation capability of the target firm (Hoskisson & Hitt, 1994; Singh & Montgomery, 1987). Thus, I suggested that the relatedness of the acquirer and target firms would mitigate the effects of a target's competitive pattern signaling. However, it is possible that instead of mitigating the effects of the firm's competitive pattern signals, relatedness enhances these effects, as the greater the relatedness between a target and an acquirer, the more certainty the acquirer might have in pricing acquisition offers. But, this more accurate pricing may be either more positive, or more negative, leading to the insignificance of a directional relationship as found in my results. In other words, firm relatedness may further reduce information asymmetries surrounding a target in conjunction with a target's competitive pattern signaling. Thus, greater firm relatedness may be associated with greater variance in acquisition premiums, as opposed to always mitigating the patterns' effects.

Additionally, a possible empirical explanation for this insignificance across many samples may be the difficulty in classifying a large diversified organization into a single SIC code. If the firm is operating in many different businesses, corporate SIC codes may not accurately reflect the organizations knowledge and familiarity with the business of a target firm. An alternative measure of firm relatedness was tested to help better capture the structural differences between buyers and targets as opposed to the industry relatedness. However, this measure caused high multicollinearity in my models, which

can produce biased estimates and large standard errors. An implication of my non-finding, given the consistent non-findings in previous research, may suggest that while there seems a theoretical reason to expect industry similarity might influence acquisition premia, there is no supporting empirical evidence for a direct relationship. Instead, this linkage may be mediated by another mechanism, such as information asymmetries, that is confounding the results.

Hypothesis 5a, 5b, and 5c suggest that environmental dynamism positively moderates the positive relationships between competitive simplicity, similarity, and predictability, and acquisition premium such that these relationships become more positive when dynamism increases. The interaction coefficients for dynamism in Table B2, Models 3 – 7 were all insignificant. Empirically, these results could be due to relatively low power increasing Type II errors as discussed above; but, considering the lack of significance in even the most simple of models (Table B4, Model 1), this non-finding is not likely to change with greater observations. Also, the lack of significance for environmental dynamism may be due to the relatively low variance of dynamism in my sample. Specifically, with a mean of 0.03 and a variance of 0.03, there may not be enough variance to accurately determine differences in dynamism across acquisitions in my sample.

Theoretically, the uncertainty associated with dynamism in the target firm's industry may not be increasing the salience of repertoire characteristics as predicted because the three properties are less effective in dynamic environments. While I hypothesized that the increased ambiguity associated with a dynamic target firm

environment may lead buyers to seek and rely on patterns more (Whitson & Galinsky, 2008), the value of the signals and the resources they represent may be altered in dynamic environments (Priem & Butler, 2001). For example, I suggested a target firm exhibiting a simple competitive repertoire might be signaling that their strategic resources are valuable, rare, nonsubstitutable, and difficult to imitate, and thus can sustain the firm's competitive advantage. However, a signal of the presence of strategic resources may not be as effective in dynamic environments because acquirers might expect that these resources can be rendered obsolete rapidly. Thus, in dynamic environments the ability to sustain a simple competitive repertoire may be less favored than evidence of the ability to consistently generate new capabilities in order to maintain a competitive advantage. The advantages of similar and predictable competitive patterns may be also less effective in turbulent dynamic markets.

Furthermore, while this study focused on dynamism in the target firm's focal industry, it may be relevant to consider the uncertainty faced by the acquirer instead. Specifically, while I focused on the target's perspective and environment, the buyer's environment might have more of an influence on the salience of pattern characteristics than the target firm because the collection and evaluation of current and historical information about a potential target firm occurs in the acquirer's industry as opposed to in the target's industry. In other words, while the acquirer is entering the target's environment through the acquisition, the signals of competitive repertoire patterns are being received and interpreted by the buyer in its own environment.

Limitations and Future Research

As with any study, this research is subject to some important limitations that might influence the generalizability and applicability of this work. First, this sample is from a single region, North America. This restriction reduces possible variations in the difficulty associated with understanding foreign targets in a cross-border acquisition, but it also reduces the generalizability of the results. Furthermore, in an effort to objectively assess and compare acquisition premiums across multiple firms and industries, only public target firms were considered. While there might be reason to expect that the uncertainty associated with acquisitions of private firms might cause greater attenuation of all available signals, it is difficult to develop an objective, financial evaluation of a private firm prior to an acquisition. Thus, it would have been impossible to compare the premiums received.

These sample restrictions, coupled with the desire to focus on entrepreneurial, high growth firms that may desire a profitable exit, led to an overall small sample size. With only 129 firms satisfying all of the sample criteria without any missing information across multiple independent, dependent, and control variables, there are possible issues with the statistical power of my models. Thus, it is possible some of my hypothesized relationships exist, but my sample and data were unable to demonstrate those relationships due to Type II error.

Third, and perhaps most importantly, this study did not directly test the recognition, use, and impact of signals – specifically competitive behavior patterns – in the decision making process of the acquirer. A common issue in research on strategic

decisions in firms (Hambrick, 2007), this inability to see inside the "black box" at the top of the firm requires future research to employ alternative approaches such as survey methods or coding meeting minutes (Tuggle, Schnatterly, & Johnson, 2010). Similarly, when considering a single outcome, such as acquisition premium, it should be recognized that this outcome was the product of multiple decisions resulting from the coordinated actions of many different individuals (Klein & House, 1995; Waldman, Ramierez, House, & Puranam, 2001). Thus, acquisition and premium research might benefit from greater attention to the team dynamics and decision making processes amongst a firm's executives and its board of directors, such the work on TMT behavioral integration (e.g. Simsek, Veiga, Lubatkin, & Dino, 2005).

In addition to the opportunities provided by addressing these limitations, the theory and results presented in this dissertation suggest many promising areas for further research. First, as discussed earlier in regards to my non-findings, because reducing information asymmetries may lead to either an increase or a decrease in a target firm's acquisition premium, there is an important opportunity to explore other dependent variables that might more consistently reflect the effects of reducing information asymmetries. For example, buyers that acquire target firms exhibiting simple, similar, and predictable competitive repertoires may experience better post-acquisition performance because of the reduced information asymmetries leading to improved target selection. (King et al., 2004).

Also, future research could explore a portfolio approach to competitive behavior patterns. While multiple studies in competitive dynamics have considered various

repertoire characteristics (Ferrier, 2001; Ndofor et al., 2011; Rindova et al., 2010), none have considered how these characteristics might work together to influence outcomes. Specifically, given the positive influence of simplicity and negative influence of similarity, it would be valuable and interesting to explore if the interaction of simplicity and deviance has an additive effect for acquisition premium or if a firm signaling with these two patterns simultaneously mitigates premium effects. Also, despite competitive predictability's non-significance, might it interact with simplicity or similarity enhance or mitigate the effects for a target firm's received premium?

Future research focused on understanding the competitive patterns used by acquirers might also provide valuable insight to target selection research. Specifically, would a buyer have a higher evaluation of a target firm engaging in a simple repertoire if the buyer also engages in such a pattern of competitive behavior? Would similarity between buyer and target firms' competitive patterns enhance the understanding and evaluation of these patterns? Also, could similar competitive patterns between the target and acquirer improve acquisition performance due to easier integration? In a similar vein, future research might explore if the similarity between the target's and acquirer's competitive patterns enhances the innovation outcomes of acquisitions.

In this dissertation, I focused on the competitive patterns at the corporate level of analysis, but considering the diversity of businesses that might exist within a single corporation, it might be interesting to examine the relatedness between target and acquirer competitive patterns at the business level. This examination may bring new

insights to the discussion of industry relatedness by providing additional understanding of the businesses involved in the acquisition.

Another area of future research that might prove promising is a closer look at target and acquirer governance characteristics. While this study does not explore the causes of competitive patterns, it would be interesting to examine how governance characteristics could influence the emergence and management of competitive patterns. Research by Connelly and colleagues has shown that different types of institutional owners can influence the types of actions taken by firms (Connelly, Tihanyi, Certo & Hitt, 2010). Could different types of owners, such as institutional owners, family owners, etc., influence managers to use different types of competitive behavior patterns? Similarly, could different types of owners have an impact on which competitive patterns might be attenuated to in a potential target firm?

Finally, context was an important component of this research. While previous research has found that engaging in a simple competitive repertoire is associated with decreased performance (Ferrier, 2001; Ndofor et al., 2011), I suggested and found that in the M&A market, engaging in a simple repertoire is associated with a 40 percent increase in premium. While this is an important contingency for competitive dynamics, there are many more contingencies that can be explored. For example, could the impact of competitive patterns as signals change when either the acquirer or target industry is in decline? Also, acquisition performance has been linked to firms responding to the pressures associated with a M&A wave in an industry (Haleblian & Dykes, 2008); future research could explore how a target firm might best position itself during a M&A wave

relative to its rivals to extract the highest premium from a potential buyer. Lastly, the impact of competitive action patterns may extend beyond acquisitions to other corporate-level strategies, such as alliances. How might the similarity or differences between two firms' competitive behavior patterns impact alliance performance or innovation?

Conclusion

This dissertation integrates work on competitive behavior and acquisition premium research to extend signaling theory by suggesting that patterns in competitive repertoires can serve as unique signals for a target firm in the M&A market. My results suggest that, despite previous research finding negative effects on performance, target firms engaging in a simple competitive action repertoire are associated with a 40 percent increase in acquisition premiums. However, my results also suggest that competitive similarity is associated with a 28 percent decline in acquisition premiums on average. Also, while I propose buyer and environmental characteristics moderate the salience of competitive repertoire characteristics as signals, I find no supporting evidence for these effects. Overall, this research suggests that target firms are active participants in the M&A market and that patterns of competitive behavior can serve as complex signals to potential buyers. The novelty of considering patterns of competitive behavior as signals presents multiple opportunities for future research at both the business- and corporate-levels of analysis.

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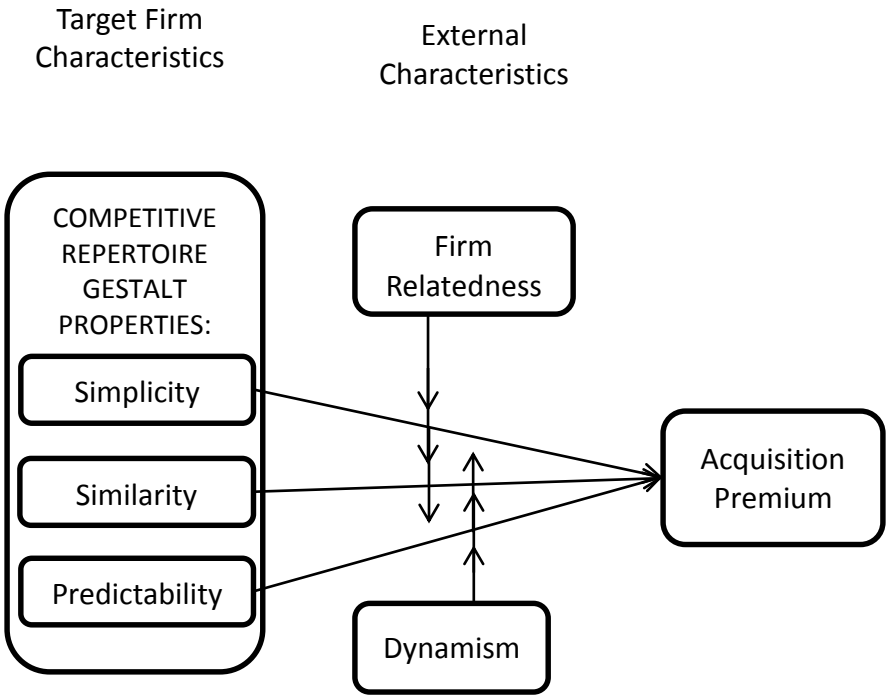
APPENDIX A

Figure A1: Theoretical Model



APPENDIX B

Table B1: Descriptive Statistics and Correlations

		Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	Premium (1 week)	42.49	62.47	1.00																
(2)	Target Performance	-28.81	87.18	-0.04	1.00															
(3)	Acquirer Performance	-14.33	130.62	0.11	0.47	1.00														
(4)	Target Firm Size	5.32	1.56	-0.18	0.33	0.04	1.00													
(5)	Time Since IPO	3.13	1.29	-0.07	0.07	0.09	-0.02	1.00												
(6)	Deal Size	5.50	1.80	-0.07	0.42	0.11	0.74	-0.03	1.00											
(7)	Relative Size	0.53	1.71	-0.12	0.00	-0.07	0.07	0.03	-0.19	1.00										
(8)	Payment Method	1.61	1.05	-0.01	-0.13	-0.15	0.11	-0.12	-0.05	0.14	1.00									
(9)	Target Investment Advisors	2.87	1.54	-0.02	0.22	0.02	0.43	0.00	0.54	-0.09	-0.02	1.00								
(10)	Acquirer Investment Advisors	2.62	1.86	-0.11	0.25	0.02	0.48	0.02	0.62	-0.10	0.04	0.48	1.00							
(11)	Environmental Munificence	0.11	0.10	0.03	-0.07	-0.07	0.10	-0.07	-0.01	0.01	0.16	0.13	0.03	1.00						
(12)	Environmental Complexity	0.20	0.16	-0.07	0.09	0.06	0.05	-0.09	-0.03	0.15	-0.11	-0.11	-0.07	-0.05	1.00					
(13)	High-Tech Industry	0.57	0.50	0.14	-0.17	-0.08	-0.34	-0.05	-0.08	-0.10	-0.19	-0.01	-0.04	-0.07	-0.24	1.00				
(14)	Competitive Simplicity	0.86	0.23	0.09	0.01	-0.01	-0.08	0.10	-0.11	0.01	-0.05	-0.13	-0.06	-0.01	0.05	-0.23	1.00			
(15)	Competitive Similarity	0.66	0.33	-0.13	0.03	0.18	0.05	0.13	0.07	0.06	0.14	-0.06	0.08	0.02	-0.08	-0.04	-0.17	1.00		
(16)	Competitive Predictability	-0.27	0.65	-0.02	0.23	0.06	-0.18	0.08	-0.03	-0.05	-0.20	-0.09	-0.08	-0.09	0.08	-0.04	0.47	-0.24	1.00	
(17)	Firm Relatedness	1.07	0.99	0.11	-0.07	0.08	-0.13	0.06	-0.16	-0.11	-0.05	-0.08	-0.06	0.01	-0.04	-0.11	0.11	-0.06	-0.05	1.00
(18)	Environmental Dynamism	0.03	0.03	-0.08	0.12	0.06	0.28	0.09	0.16	0.03	0.12	0.13	0.12	0.16	0.12	-0.26	0.07	-0.01	-0.01	-0.05

Correlations greater than |0.14| are significant at $p < 0.05$

N = 129

Table B2: HLM Results

DV: 1 Week Premium	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Intercept	64.520 **	16.457	13.114	16.224	19.919	12.753	20.377	10.245
Target Performance	-0.065	-0.021	-0.033	-0.021	-0.015	-0.031	-0.015	-0.037
Acquirer Performance	0.081 ***	0.084 ***	0.093 ***	0.086 ***	0.085 ***	0.089 ***	0.085 ***	0.094 ***
Target Firm Size	-11.362 **	-10.891 *	-12.233 **	-10.762 *	-11.709 *	-11.274 **	-11.710 *	-11.392 **
Time Since IPO	-1.625	-0.703	-0.924	-1.006	-0.923	-0.472	-0.864	-1.013
Deal Size	6.922	8.445 +	9.222 +	8.409 +	8.586 +	9.027 +	8.701 +	8.816 +
Relative Size	-0.679	-0.770	0.901	-0.980	-0.920	0.083	-1.125	1.426
Payment Method	0.601	6.879	7.082	6.890	7.352	6.314	7.080	7.078
Target Investment Advisors	4.671 +	6.052 *	6.288 +	5.820 +	5.978 *	6.149 *	5.881 +	6.523 *
Acquirer Investment Advisors	-2.267	-3.295 +	-3.065 +	-3.381 +	-3.287 +	-3.207 +	-3.319 +	-2.957
Environmental Munificence	-2.965	11.496	13.667	14.105	15.089	11.891	16.258	7.512
Environmental Complexity	-31.426	-10.009	-4.906	-11.547	-5.598	-9.424	-6.552	-8.842
High-Tech Industry	15.701 *	23.688 **	24.629 **	24.202 **	22.459 **	25.338 **	22.900 **	25.169 **
Competitive Simplicity		39.914 **	34.162 *	40.286 **	34.417 *	40.169 **	35.200 *	39.876 **
Competitive Similarity		-27.824 *	-27.526 *	-26.205 *	-28.676 *	-27.685 +	-29.058 *	-26.514 +
Competitive Predictability		-6.882	-6.704	-7.633	-7.819	-6.512	-8.150	-5.442
Firm Relatedness		-0.440	-2.506	-0.540	-0.854	-0.783	-0.448	-2.510
Environmental Dynamism		-127.492	-166.675	-75.710	-186.302 +	-108.942	-176.348	-107.908
Competitive Similarity x Dynamism			-16.369	265.032			34.595	
Competitive Similarity x Firm Relatedness			-2.738	-2.581				-2.449
Competitive Simplicity x Dynamism			-639.605		-634.924		-633.864	
Competitive Simplicity x Firm Relatedness			-18.527		-5.883			-19.870+
Competitive Predictability x Dynamism			-35.302			-11.200	24.087	
Competitive Predictability x Firm Relatedness			9.970			6.496		9.815
Year Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included
Observations	168	129	129	129	129	129	129	129
Number of Groups	70	58	58	58	58	58	58	58
Chi-squared	411.1 ***	723.6 ***	990.1 ***	819.7 ***	977.2 ***	825.9 ***	958.9 ***	944 ***

Robust standard errors

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table B3: Dependent Variable Robustness Models

DV: Premium	1 Week		1 Day		4 Weeks	
	Model 1		Model 2		Model 3	
Intercept	16.457		28.714		24.409	
Target Performance	-0.021		0.019		0.044	+
Acquirer Performance	0.084	***	0.014		0.066	***
Target Firm Size	-10.891	*	-9.042	*	-12.124	*
Time Since IPO	-0.703		1.696		-0.824	
Deal Size	8.445	+	4.981		8.776	+
Relative Size	-0.770		-4.474		-5.153	
Payment Method	6.879		5.577		3.261	
Target Investment Advisors	6.052	*	7.579	*	4.028	
Acquirer Investment Advisors	-3.295	+	-4.721	+	-2.134	
Environmental Munificence	11.496		-13.356		32.460	
Environmental Complexity	-10.009		-24.010		21.534	
High-Tech Industry	23.688	**	21.051	**	13.910	+
Competitive Simplicity	39.914	**	38.007	**	25.613	
Competitive Similarity	-27.824	*	-11.499		-27.849	*
Competitive Predictability	-6.882		-6.328		-9.540	+
Firm Relatedness	-0.440		-1.788		0.386	
Environmental Dynamism	-127.492		-69.315		-149.781	
Year Fixed Effects						
Observations	129		129		127	
Number of Groups	58		58		57	
Chi-squared	723.6	***	176.9	***	1098.0	***

Robust Standard errors

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table B4: Overspecification Sensitivity Analyses

DV: Premium	IVs Only	IVs + Year Categorical Control	"When in doubt, leave it out"	Full Model using Year Categorical Control	IVs + Year Fixed Effects	"When in doubt, leave it out"	Full Model using Year Fixed Effects
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	41.378 ***	-1,064.408	-1,052.590	-2,439.182	21.810 **	20.439	16.457
Target Performance			-0.008	-0.006		-0.021	-0.021
Acquirer Performance			0.071 ***	0.069 ***		0.083 ***	0.084 ***
Target Firm Size			-8.932 *	-8.494 +		-11.358 **	-10.891 *
Time Since IPO				-0.088			-0.703
Deal Size			6.500	7.012		8.937 *	8.445 +
Relative Size				-3.287			-0.770
Payment Method			7.762 +	8.792 *		6.600	6.879
Target Investment Advisors				4.091			6.052 *
Acquirer Investment Advisors				-3.794 +			-3.295 +
Environmental Munificence				48.032			11.496
Environmental Complexity				21.656			-10.009
High-Tech Industry			22.686 **	26.922 **		20.516 **	23.688 **
Competitive Simplicity	27.709 *	28.433 *	31.633 *	34.874 *	32.462 **	34.358 **	39.914 **
Competitive Similarity	-28.771	-29.397	-25.942 +	-25.646 +	-29.239 +	-31.682 *	-27.824 *
Competitive Predictability	-9.217 +	-9.567 *	-8.535 +	-7.875	-8.867	-7.616	-6.882
Firm Relatedness	4.348	3.954	0.635	1.206	3.608	-0.121	-0.440
Environmental Dynamism	-140.524	-139.895	-133.410	-174.138	-163.159	-137.759	-127.492
Year (1 variable, 2000-2010)		0.552	0.536	1.218			
Year Fixed Effects (10 dummies)					Included	Included	Included
Observations	131	131	129	129	131	129	129
Number of Groups	58	58	58	58	58	58	58
Chi-squared	14.4 **	14.5 *	263.1 ***	310.7 ***	33.3 **	509.4 ***	723.6 ***

Robust Standard errors

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table B5: Sample Selection Heckman Analyses

	HLM Model	5th Year Variable	5 Year Average	Year Prior to Acquisition
Acquisition Premium Model	Model 1	Model 2	Model 3	Model 4
Year Fixed Effects	Included	Included	Included	Included
Intercept	34.483	15.712	120.168	40.087
Target Performance	28.332	26.060	22.108	25.127
Acquirer Performance	1.066	-2.814	17.571	-2.547
Target Firm Size	-13.636 +	-17.018 +	-14.030 +	-13.182
Time Since IPO	-1.158	22.159	1.098	6.660
Deal Size	8.384	11.853	9.975	7.531
Relative Size	-0.309	-0.731	-0.357	-0.606
Payment Method	18.033 +	21.112 *	17.610 *	20.876 *
Target Investment Advisors	6.393	8.655	5.177	10.234
Acquirer Investment Advisors	-7.280 +	-12.731 *	-7.171 +	-11.174 +
Environmental Munificence	62.076	42.852	-17.289	52.251
Environmental Complexity	12.910	23.862	57.959	14.483
High-Tech Industry	1.064	-26.823	-14.110	-18.137
Competitive Simplicity	40.129 **	56.576	70.303 +	53.837
Competitive Similarity	-62.480 +	-74.256 **	-54.559 *	-77.311 **
Competitive Predictability	-19.064 +	-26.322	-22.160 +	-24.823
Firm Relatedness	7.977	5.006	7.555	6.194
Environmental Dynamism	-195.706	-191.726	-192.764	-261.847
Selection Equation Variables				
Year Fixed Effects		Included	Included	Included
Intercept		-7.398	-6.762	-9.743
Target Performance		0.252	0.100	-0.215
Target Firm Size		-0.001	0.014	0.026
Time Since IPO		-1.163 ***	-0.060	-0.801 ***
Environmental Munificence		0.965	2.040 **	1.265
Environmental Complexity		-0.947	0.152	-1.185
High-Tech Industry		0.469 +	0.214	1.122 *
Competitive Simplicity		0.391	-1.083 ***	1.219
Competitive Similarity		0.478	-0.372 +	0.791
Competitive Predictability		0.094	0.107	-0.061
Environmental Dynamism		4.869	-1.114	16.588 *
Major Exchange		-0.056	0.001	-0.595
Industry M&A Activity		0.000 +	0.000 ***	0.001 +
Mills Lambda		-51.159	-45.935	-34.608
Chi-squared	69.7 ***	28.1	31.1	30.0
N	107	939	1,382	199
Non-sample Firms		858	1278	118
Sample Firms		81	104	81
*** p<0.001, ** p<0.01, * p<0.05, + p<0.1	HLM using Robust Std Errors	Two Step Heckman, using Heckman Std Errors		

Table B6: Sample Selection Heckman Models: Failed vs Completed Acquisitions

	Failed within 5 yrs of IPO vs Sample		Failed Acquisition vs Sample	
Acquisition Premium Model	Model 1		Model 2	
Year Fixed Effects	Included		Included	
Intercept	35.542		20.919	
Target Performance	0.023		0.006	
Acquirer Performance	0.223	+	0.202	
Target Firm Size	-9.153	+	-8.100	
Time Since IPO	1.516		-0.661	
Deal Size	3.415		2.650	
Relative Size	-6.654		-6.314	
Payment Method	9.700	+	10.630	*
Target Investment Advisors	9.926	**	10.702	**
Acquirer Investment Advisors	-4.497		-4.778	
Environmental Munificence	-33.452		-25.120	
Environmental Complexity	-37.189		-40.053	
High-Tech Industry	19.679	+	23.737	*
Competitive Simplicity	51.724	*	64.135	**
Competitive Similarity	-13.098		-17.020	
Competitive Predictability	-14.281	+	-10.962	
Firm Relatedness	-7.182	+	-6.858+	+
Environmental Dynamism	-68.517		-58.593	
Selection Equation Variables				
Year Fixed Effects	Included		Included	
Intercept	1.467		-1.416	
Target Performance	-0.008		-0.004	
Target Firm Size	-0.021		-0.073	
Time Since IPO	-0.291	*	-0.518	***
Environmental Munificence	0.950		0.426	
Environmental Complexity	-0.483		-1.205	
High-Tech Industry	0.327		0.296	
Competitive Simplicity	1.341		1.730	*
Competitive Similarity	-1.542	+	-1.079	+
Competitive Predictability	0.557		0.300	
Environmental Dynamism	2.118		6.141	
Major Exchange	0.739		0.593	
Industry M&A Activity	-0.000		-0.000	
Mills Lambda	-17.894		8.836	
Chi-squared	47.2	**	48.9	**
N	118		151	
Non-sample Firms	23		56	
Sample Firms	95		95	
*** p<0.001, ** p<0.01, * p<0.05, + p<0.1	Two Step Heckman, using Heckman Std Errors			

Table B7: Descriptive Statistics and Correlations using Diversification Firm Relatedness

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) Premium (1 week)	42.49	62.47	1.00																
(2) Target Performance	-28.81	87.18	-0.04	1.00															
(3) Acquirer Performance	-14.33	130.62	0.11	0.47	1.00														
(4) Target Firm Size	5.32	1.56	-0.18	0.33	0.04	1.00													
(5) Time Since IPO	3.13	1.29	-0.07	0.07	0.09	-0.02	1.00												
(6) Deal Size	5.50	1.80	-0.07	0.42	0.11	0.74	-0.03	1.00											
(7) Relative Size	0.53	1.71	-0.12	0.00	-0.07	0.07	0.03	-0.19	1.00										
(8) Payment Method	1.61	1.05	-0.01	-0.13	-0.15	0.11	-0.12	-0.05	0.14	1.00									
(9) Target Investment Advisors	2.87	1.54	-0.02	0.22	0.02	0.43	0.00	0.54	-0.09	-0.02	1.00								
(10) Acquirer Investment Advisors	2.62	1.86	-0.11	0.25	0.02	0.48	0.02	0.62	-0.10	0.04	0.48	1.00							
(11) Environmental Munificence	0.11	0.10	0.03	-0.07	-0.07	0.10	-0.07	-0.01	0.01	0.16	0.13	0.03	1.00						
(12) Environmental Complexity	0.20	0.16	-0.07	0.09	0.06	0.05	-0.09	-0.03	0.15	-0.11	-0.11	-0.07	-0.05	1.00					
(13) High-Tech Industry	0.57	0.50	0.14	-0.17	-0.08	-0.34	-0.05	-0.08	-0.10	-0.19	-0.01	-0.04	-0.07	-0.24	1.00				
(14) Competitive Simplicity	0.86	0.23	0.09	0.01	-0.01	-0.08	0.10	-0.11	0.01	-0.05	-0.13	-0.06	-0.01	0.05	-0.23	1.00			
(15) Competitive Similarity	0.66	0.33	-0.13	0.03	0.18	0.05	0.13	0.07	0.06	0.14	-0.06	0.08	0.02	-0.08	-0.04	-0.17	1.00		
(16) Competitive Predictability	-0.27	0.65	-0.02	0.23	0.06	-0.18	0.08	-0.03	-0.05	-0.20	-0.09	-0.08	-0.09	0.08	-0.04	0.47	-0.24	1.00	
(17) Firm Relatedness (Diversification)	0.31	0.56	0.26	0.14	0.22	-0.09	0.09	0.15	-0.16	-0.18	-0.10	-0.00	-0.17	-0.09	0.28	0.02	0.02	-0.10	1.00
(18) Environmental Dynamism	0.03	0.03	-0.08	0.12	0.06	0.28	0.09	0.16	0.03	0.12	0.13	0.12	0.16	0.12	-0.26	0.07	-0.01	-0.01	-0.08

Correlations greater than |0.14| are significant at $p < 0.05$

N=71

Table B8: Descriptive Statistics and Correlations including Firm Competitive Activity

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Premium (1 week)	42.49	62.47	1.00																	
(2) Target Performance	-28.81	87.18	-0.04	1.00																
(3) Acquirer Performance	-14.33	130.62	0.11	0.47	1.00															
(4) Target Firm Size	5.32	1.56	-0.18	0.33	0.04	1.00														
(5) Time Since IPO	3.13	1.29	-0.07	0.07	0.09	-0.02	1.00													
(6) Deal Size	5.50	1.80	-0.07	0.42	0.11	0.74	-0.03	1.00												
(7) Relative Size	0.53	1.71	-0.12	0.00	-0.07	0.07	0.03	-0.19	1.00											
(8) Payment Method	1.61	1.05	-0.01	-0.13	-0.15	0.11	-0.12	-0.05	0.14	1.00										
(9) Target Investment Advisors	2.87	1.54	-0.02	0.22	0.02	0.43	0.00	0.54	-0.09	-0.02	1.00									
(10) Acquirer Investment Advisors	2.62	1.86	-0.11	0.25	0.02	0.48	0.02	0.62	-0.10	0.04	0.48	1.00								
(11) Environmental Munificence	0.11	0.10	0.03	-0.07	-0.07	0.10	-0.07	-0.01	0.01	0.16	0.13	0.03	1.00							
(12) Environmental Complexity	0.20	0.16	-0.07	0.09	0.06	0.05	-0.09	-0.03	0.15	-0.11	-0.11	-0.07	-0.05	1.00						
(13) High-Tech Industry	0.57	0.50	0.14	-0.17	-0.08	-0.34	-0.05	-0.08	-0.10	-0.19	-0.01	-0.04	-0.07	-0.24	1.00					
(14) Firm Competitive Activity	2.54	9.89	0.03	0.00	0.01	0.02	0.04	0.03	-0.01	0.07	0.13	0.03	-0.09	-0.01	-0.03	1.00				
(15) Competitive Simplicity	0.86	0.23	0.09	0.01	-0.01	-0.08	0.10	-0.11	0.01	-0.05	-0.13	-0.06	-0.01	0.05	-0.23	-0.14	1.00			
(16) Competitive Similarity	0.66	0.33	-0.13	0.03	0.18	0.05	0.13	0.07	0.06	0.14	-0.06	0.08	0.02	-0.08	-0.04	-0.05	-0.17	1.00		
(17) Competitive Predictability	-0.27	0.65	-0.02	0.23	0.06	-0.18	0.08	-0.03	-0.05	-0.20	-0.09	-0.08	-0.09	0.08	-0.04	-0.27	0.47	-0.24	1.00	
(18) Firm Relatedness	1.07	0.99	0.11	-0.07	0.08	-0.13	0.06	-0.16	-0.11	-0.05	-0.08	-0.06	0.01	-0.04	-0.11	0.07	0.11	-0.06	-0.05	1.00
(19) Environmental Dynamism	0.03	0.03	-0.08	0.12	0.06	0.28	0.09	0.16	0.03	0.12	0.13	0.12	0.16	0.12	-0.26	0.24	0.07	-0.01	-0.01	-0.05

Correlations greater than |0.13| are significant at $p < 0.05$

N = 129

Table B9: HLM Results including Firm Competitive Activity

DV: 1 Week Premium	Model 1	Model 2	Model 3
Intercept	64.766 **	15.561	12.050
Target Performance	-0.065	-0.022	-0.035
Acquirer Performance	0.081 ***	0.085 ***	0.097 ***
Target Firm Size	-11.285 **	-10.538 *	-11.249 *
Time Since IPO	-1.680	-0.772	-1.719
Deal Size	6.926	8.311	8.660 +
Relative Size	-0.568	-0.578	2.448
Payment Method	0.409	6.792	7.093
Target Investment Advisors	4.415	5.834	5.700 +
Acquirer Investment Advisors	-2.241	-3.260	-2.626
Environmental Munificence	-0.580	15.349	25.847
Environmental Complexity	-31.175	-9.690	-4.658
High-Tech Industry	15.854 *	24.068 **	26.050 **
Firm Competitive Activity	0.155	0.133	0.525 *
Competitive Simplicity		39.812 **	35.050 *
Competitive Similarity		-27.343 +	-27.883 *
Competitive Predictability		-6.132	-3.549
Firm Relatedness		-0.428	-2.901
Environmental Dynamism		-148.847	-279.724 *
Competitive Similarity x Dynamism			-91.528
Competitive Similarity x Firm Relatedness			-3.433
Competitive Simplicity x Dynamism			-864.546 +
Competitive Simplicity x Firm Relatedness			-22.090 +
Competitive Predictability x Dynamism			132.125
Competitive Predictability x Firm Relatedness			11.470 +
Year Fixed Effects			
Observations	168	129	129
Number of Groups	70	58	58
Chi-squared	447.1 ***	849.1 ***	1555 ***

Robust Standard errors

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1